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Featured Model: TVX \$599 Stationary, \$699 with Casters



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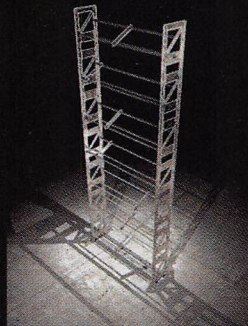
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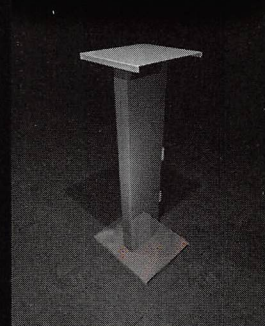
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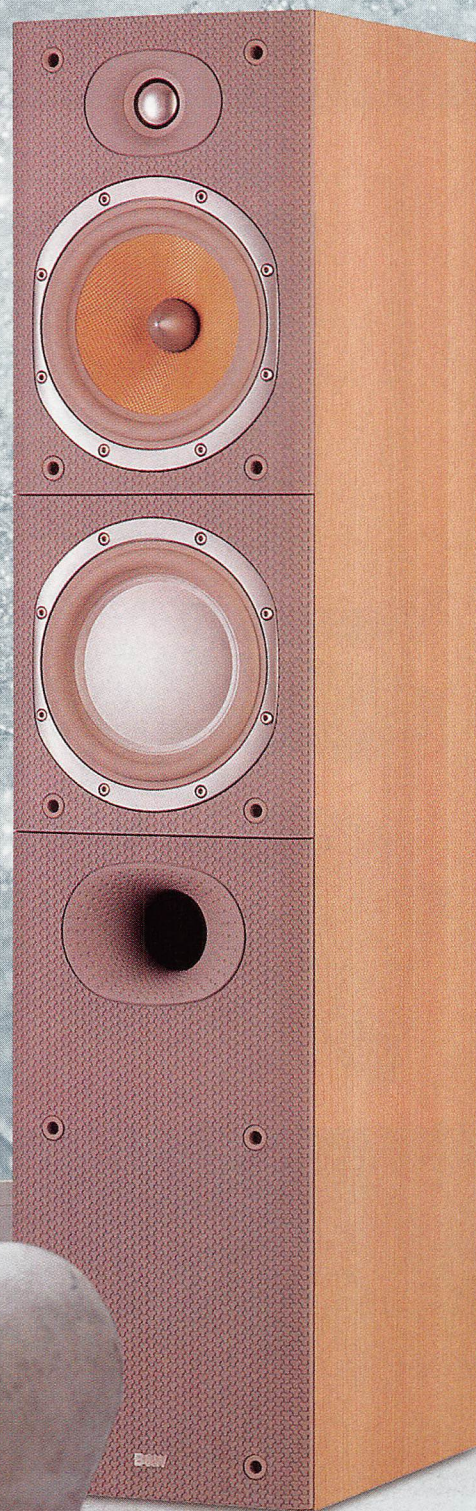
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track one

Copy No More?

We've received a steady stream of mail from readers concerned that their right to make personal copies of CDs they own is under siege.



Ever since reports started circulating last fall that some of the major music labels were experimenting with scary new kinds of copy-proof CDs, we've received a steady stream of mail from readers concerned that their right to make personal copies of CDs they own is under siege. One of the more colorful letters was from Phil Cohen, an avid music collector who lives in Bar Harbor, Florida, who wrote:

"With an already weakened economy, this would be a very bad time for the music industry to risk consumer outrage and boycotts by attempting to implement one of the sound-damaging anti-copy processes described in your November issue ('Copy-Proof CDs' in 'Random Play'). My existing record and CD collection would probably take 6 to 8 years (24 hours a day) to play in its entirety, so I don't have to buy more if I don't want to. These lame-brained anti-copy schemes will give me all the excuse I need to put an end to this music-buying obsession. My message to this paranoid industry: Release tainted product, and I'm not going to buy it. Period. It will be easy to lose us as customers but nearly impossible to get us back once we've walked away. Life has many other possibilities aside from blowing hundreds of dollars a month on your overpriced products."

Steve Oromaner, who it just so happens also hails from the Sunshine State (St. Petersburg), had this to say: "If I can't copy a CD that I've purchased, then I will no longer buy CDs. If I own a recording machine, I'm going to use it to record. I don't consider myself a pirate because I make a copy for myself or for a friend, but I feel that the music industry is trying to take that right away from me. CD recorders are intended to let you make the best copy that you can, and now they're talking encryption. If this is the way things are going to go, then they will definitely lose me as a customer. I don't think I'm alone on this issue."

No, Steve, you have plenty of company. Perhaps the most worrisome thing about these secret CD tests is the consequences even label execs didn't expect — like CDs that won't even *play* in certain machines. If you're

alarmed by any of this, or simply enjoy making CD compilations, copying CDs to play in your car, or ripping MP3 files for listening on your computer or a portable player, then turn to "Access Denied" on page 87. Veteran industry reporter Stephen Booth presents a fascinating — and at times frightening — overview of recent efforts to control what you can and can't do with the CDs you buy. If there's a silver lining in this otherwise very dark cloud, it's that the labels have learned at least one hard lesson from their early attempts at releasing so-called copy-protected CDs in Europe: *Consumers will not sit quietly on the sidelines if you sell them CDs that won't perform properly in standard CD gear.*

Meanwhile, keep the letters coming, and please let us know if you come across any of what Steve Booth calls "rogue" CDs. We'll do our best to keep you informed of the latest developments.

Sharp-eyed readers will notice a few changes in our regular departments in this issue. On page 72, we're proud to introduce "The Cutting Edge," a new section that replaces "Multimedia Maven." Our goal is to present in-depth, hands-on evaluations of one or more carefully selected "convergence" products every issue — products with style and vision, products that seem to point the way toward the next generation of entertainment systems. Gear reviewed in this section will be put through all its paces, and we'll let you know unequivocally whether or not it advances the art.

"The Cutting Edge" kicks off with David Ranada's exhaustive report on the latest addition to Sony's popular Vaio family of multimedia computers. We look forward to hearing what *you* think about our new department, and we encourage you to recommend products worthy of coverage. Drop us a line!

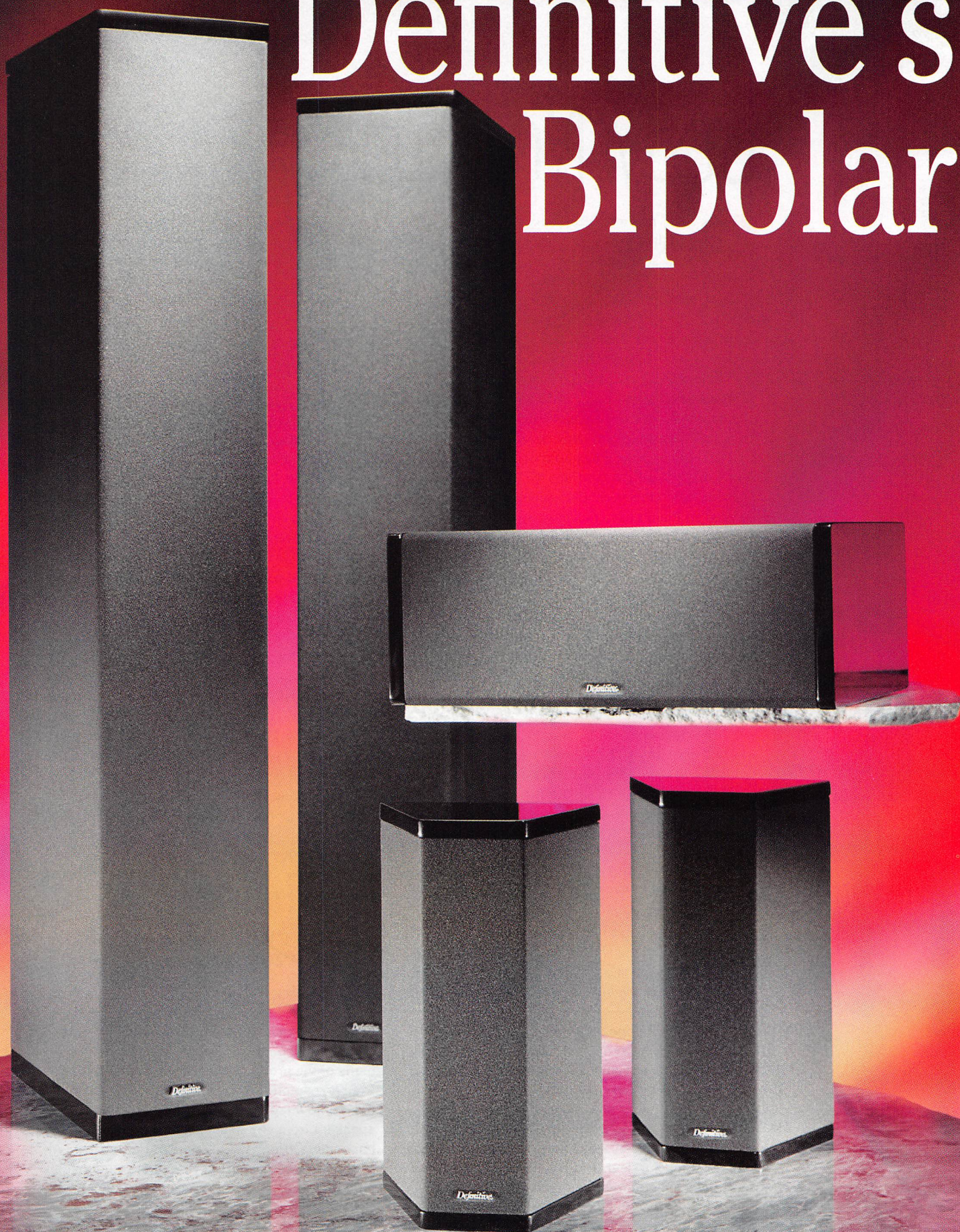
Bob Ankosko, Editor in Chief

On behalf of everyone at *Sound & Vision*, our heartfelt sympathy goes out to the family of Henry Kloss, who died in late January. I had the great pleasure of meeting Henry on several occasions over the years. Most recently, it was at a gathering in New York City a couple of years ago when the first Tivoli table radio was introduced. As always, Henry was amiable and incredibly modest. There were certainly no airs or attitude, even though he was one of audio's legends. Here was the guy who designed and

brought to market — through such venerable brands as Acoustic Research, KLH, and Advent — many of the products that helped transform hi-fi from an esoteric hobby to an element of everyday life. Try to imagine the 1960s without stereo speakers from any of the brands mentioned above. Impossible. (For a list of some of Henry's accomplishments, see page 16.) One of the audio/video industry's true innovators — and gentlemen — Henry Kloss will be sadly missed.

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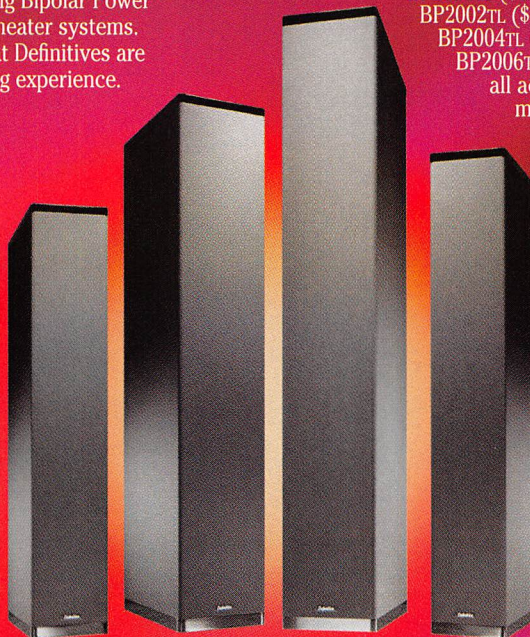
—Fred Manteghian, *Stereophile Guide to Home Theater*

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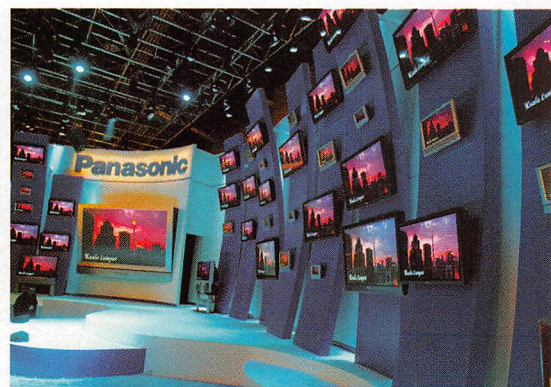
WHERE **TECHNOLOGY** BECOMES **ENTERTAINMENT**[™]

FEATURES

76 **CES Showstoppers**

Forget the casinos — the real loot in Las Vegas this winter was at the Consumer Electronics Show.

BY AL GRIFFIN, MICHAEL GAUGHN,
AND MICHAEL ANTONOFF



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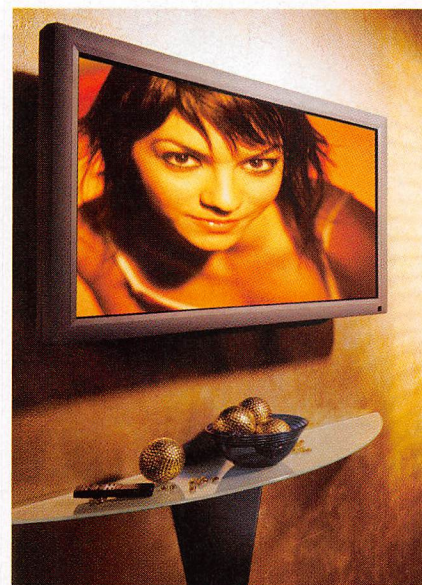
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Will the recording industry's new copy-protection schemes keep you from your music? BY STEPHEN A. BOOTH

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The inside story on those sleek, sexy — and pricey — plasma TVs.

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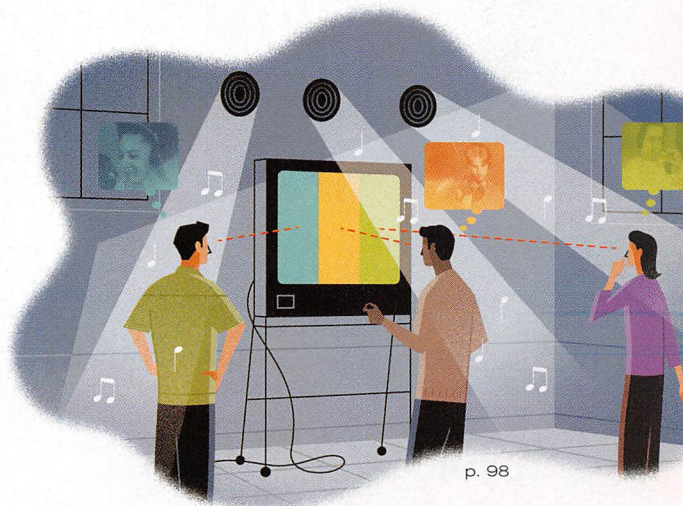
MIT's legendary Media Lab is inventing the future of home entertainment.

BY MICHAEL ANTONOFF

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Remembering George Harrison, 1943–2001

BY KEN RICHARDSON



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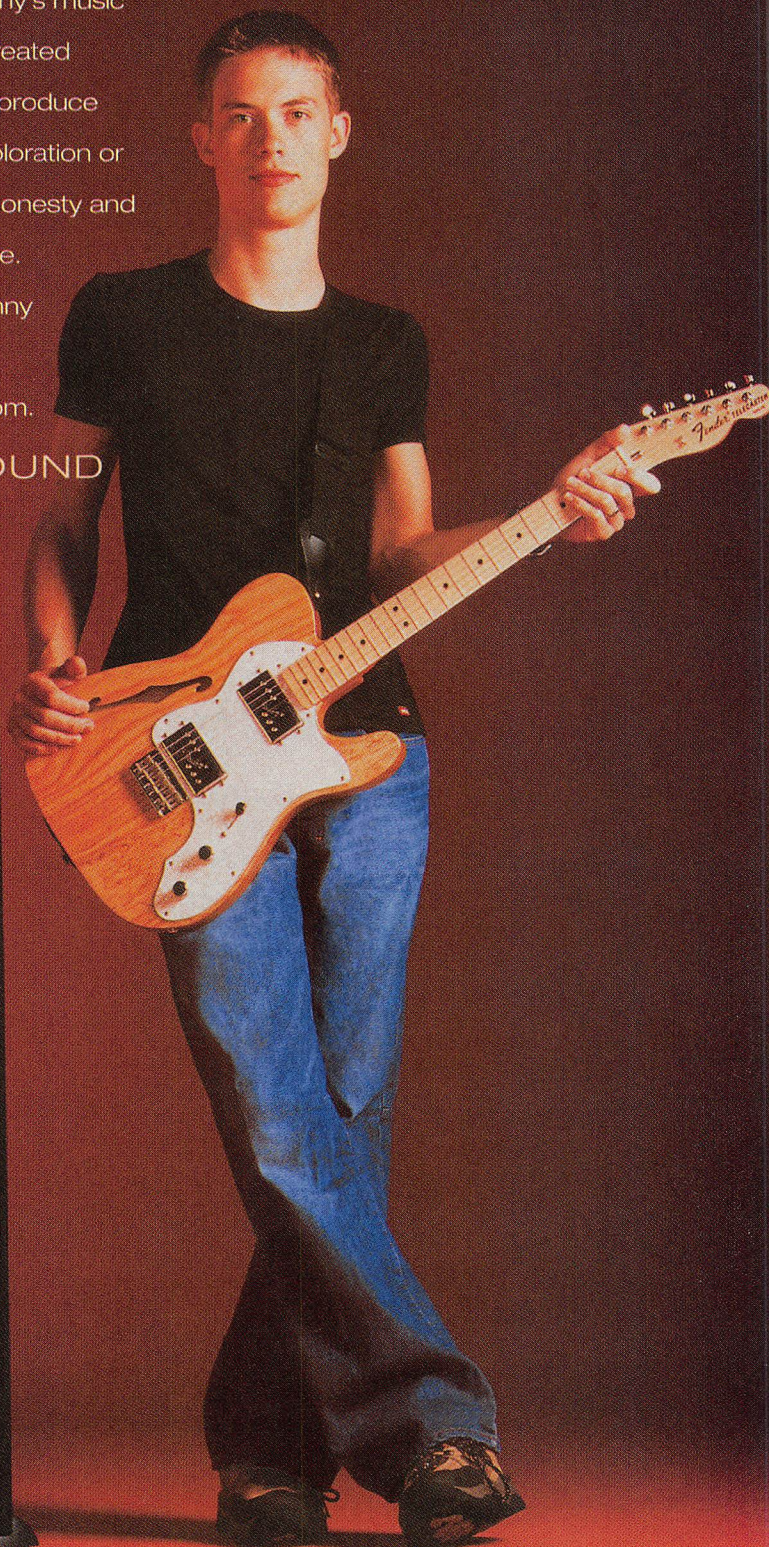
Mitsubishi DD-8020 DVD-Audio/Video player (p. 52), SonicBlue ReplayTV 4000 video hard-disk recorder (p. 64), Sharp 55-inch HDTV monitor (p. 49), Acoustic Energy Aesprit speakers (p. 68). Photo by Tony Cordero. *Ocean's 11* image courtesy Warner Bros. and Village Roadshow Pictures.

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EDITED BY BRIAN C. FENTON



SACD: Now Playing at a Nearby Kiosk

Are you itching to check out those new Super Audio CD discs you've been reading about — especially the multichannel releases we've been covering in our Music section? Well, if you live anywhere near a Circuit City or Best Buy store, you just may be in luck.

Back in December, I reported in "Multichannel Report Card" that Sony was planning to deliver 1,000 SACD demonstration kiosks to retailers around the country. In

early February, the company told me it had already shipped *more than* 1,000 demo stations to Circuit and Best Buy as well as 137 to the Tweeter retail chain and 15 to Tower Records.

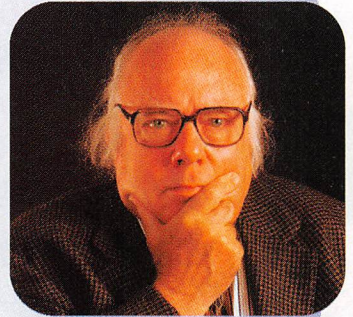
Anxious to check them out, I dropped by my local Circuit City. Sure enough, there in the audio section was a sleek, commanding display. My first thought was that it looked more like a prop from *Lost in Space* than a music listening station, but I had to admit it *was* impressive. There were racks for about 100 SACDs and a 48-page catalog listing all of the more than 320 titles currently available.

The heart of the kiosk is a Sony SACD changer and surround sound receiver. These feed a subwoofer in the base, three satellite microspeakers mounted at ear level on a thin metal bar, and a couple more micros for the surround channels suspended above and behind the listener on arching metal arms.

As I approached, some bland, unidentifiable music was playing — and no one was listening. Following the posted step-by-step instructions, I boldly cued up James Taylor's "Line 'Em Up" (from *Hourglass*) and nudged up

Goodbye, Henry

Henry Kloss, an audio and video innovator, died in late January at the age of 72. Kloss worked at Acoustic Research in the early 1950s during the development of the AR-1, the first acoustic-suspension speaker — and thus the first able to produce deep bass from a relatively small enclosure. In the 1960s he cofounded KLH, where he developed the legendary Model 8 FM radio. He moved on to found Advent, where he made the first cassette deck with Dolby B noise reduction. At Kloss Video, he won an Emmy for achievements in projection technology. He founded Cambridge SoundWorks in 1988 and sold it to Creative Labs in 1997. Finally, he moved on to Tivoli Audio, where he designed the Model One and other table radios now on the market.



JOHN BEARDSLEY

the volume. The system rocked, and other customers started drifting over to listen. A few developed those "gotta have it" stars in their eyes.

Meanwhile, the industry group behind the rival DVD-Audio format is still endeavoring to get the word out according to John Kellogg, the multichannel music honcho at Dolby Labs and a member of the DVD-Audio Group's executive committee. Kellogg says the group is planning to roll out DVD-A listening stations and to stage DVD-Audio demos in movie theaters, starting in California. No word

yet on when either promotional effort is likely to happen, though. — Rad Bennett

Hollywood Finally Goes High-Def

Four of Hollywood's home-video heavies — DreamWorks, 20th Century Fox, Artisan Entertainment, and Universal Studios — have thrown their weight behind a format for distributing films in high-definition, the JVC-developed D-Theater variant of D-VHS. Studio execs indicated they'll begin releasing D-Theater tapes by the summer, starting with back-

**EXTRAS!
EXTRAS!**

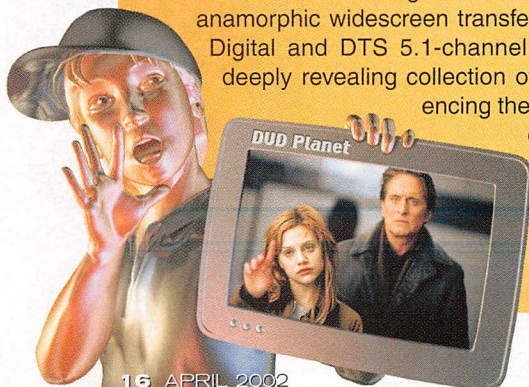
Don't Say a Word (20th Century Fox, \$28)

This psychotherapy thriller, starring Michael Douglas, has been crammed onto a single DVD that contains the 2.35:1 anamorphic widescreen transfer of the movie, Dolby Digital and DTS 5.1-channel soundtracks, and a deeply revealing collection of extras. After experiencing the film, you can lie back on the couch and absorb the full-length commentary by director Gary Fleder, then a fragmented commentary that of-

fers Douglas, Sean Bean, Brittany Murphy, Famke Janssen, and Oliver Platt talking about their roles, but only during a couple of scenes apiece.

To help in your (film) analysis, there are storyboard-to-screen comparisons, preshoot animation visualizations, and dailies of the different shots making up a scene along with the final edited version. To get deeper in touch with your inner filmmaker, check out the behind-the-camera footage with commentary by Fleder, a workshop with producers Arnold and Anne Kopelson, and the featurette on Mark Isham's musical score for the movie. And to wind up your analytical session, you can watch actress Murphy's screen tests, three deleted scenes, and a short making-of documentary.

— Josef Krebs



SOUND & VISION

TEST REPORTS

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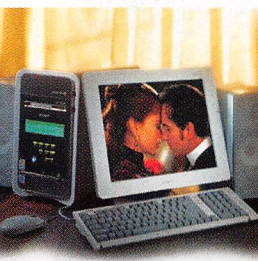
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Vaio PC runs the A/V gamut



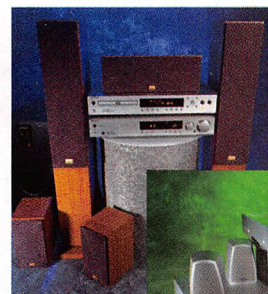
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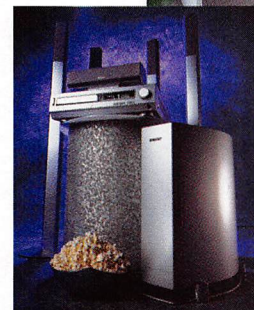
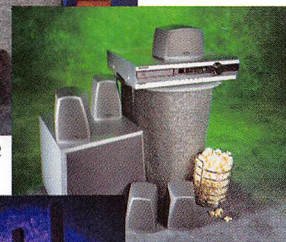
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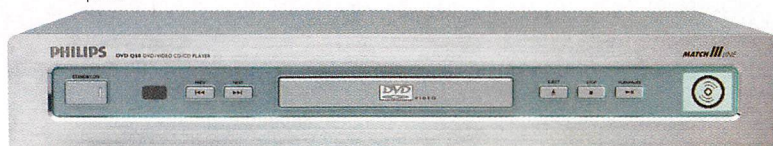
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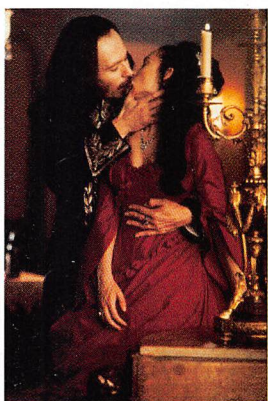
128 **S&V Picks** Star Wars takes on Star Trek. Nerds win.

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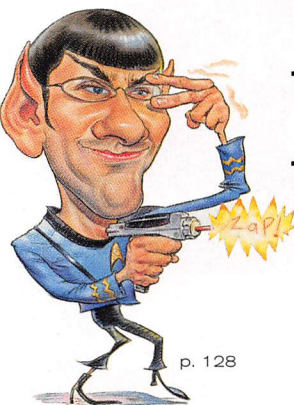


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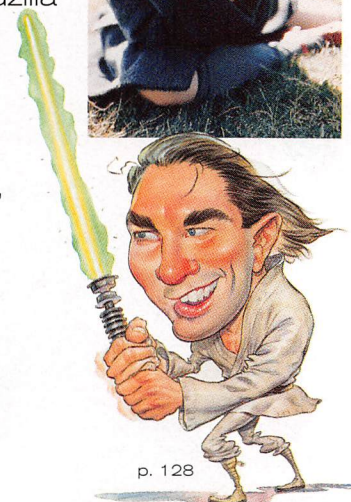
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15 Minutes with Trent Reznor of Nine Inch Nails

catalog action titles such as *X-Men*, *Die Hard*, and the *Terminator* series.

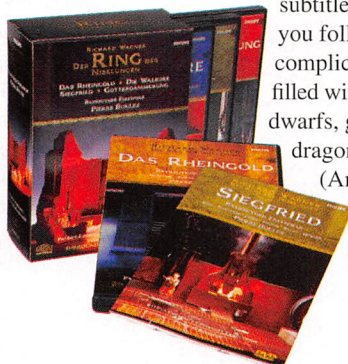
The catch is that only one D-VHS VCR model in the world so far can play those tapes, JVC's HM-DH30000U (\$1,995). But since JVC, as developer of the VHS format, won a bruising format war against Sony's Betamax nearly 20 years ago, it's confident that other D-VHS manufacturers, like Mitsubishi, will soon make their machines compatible.

The star attraction for the studios is D-Theater's claimed ability to prevent unauthorized duplication of high-def content — they hope it'll be more secure than the vulnerable encryption scheme of standard DVD-Video. And since high-def DVD is still over the horizon, they also hope enough home theater fans are hungry enough for high-def *now* to return to tape on their terms.

"I think there is a demand for a format that shows true 1080i-format material on the high-definition TVs that are out there," commented a Fox senior VP, Peter Staddon. "We're looking at 2 million HDTV-ready households," added Steve Feldstein, also of Fox. "It's the high-end user, for the most part, who wants in on this." — Doug Newcomb

Wagner, Lord of the Ring

With epic-proportioned, symbol-laden sagas the rage these days, what better time for the first complete DVD recording of Wagner's 14-hour music drama, *The Ring of the Nibelungen*, to arrive in a four-volume box set from Philips? And while viewing seven DVDs (let alone that much Wagner!) may seem daunting, on DVD the pacing is yours to control — unlike



in the opera house or the Bayreuth Festival in Germany, where this visually stunning late-1970s production originated. You can also opt for the original stereo or a remixed 5.1-channel soundtrack, plus subtitles to help you follow the complicated story filled with gods, dwarfs, giants, dragons, Valkyries (Amazons), Rhine-maidens

Trent Reznor is a driven man. He spent the bulk of last year holed up in his home studio in New Orleans readying the concurrent CD and DVD-Video of Nine Inch Nails Live: And All That Could Have Been (nothing/Interscope). When I mentioned to him how much I'd been looking forward to experiencing the final DVD mix — at the time, I'd only previewed it at the band's provocative and ever-evolving Web site, nin.com — he replied, with no trace of irony: "Yeah, me too." Now that I've had a chance to live with the finished product, I can report that the DVD offers an intense, immersive surround experience that deftly reproduces what it was like to be in the thick of the audience for NIN's acclaimed Fragility v2.0 Tour in 2000 — just the way Reznor planned it. In the aftermath of All That, Reznor, 36, is now considering recording an EP's worth of studio NIN material in 5.1.

— Mike Mettler

Did you experience any problems mixing a live performance to 5.1 channels?

The main problem I ran into was, what the hell do I do with the center channel? We did quite a lot of research, and, after listening to every live DVD out there, we started questioning the whole point of the center channel. While it can bring things out in a mix, it can also destroy a mix. By the way, two examples of poorly mixed [multichannel] DVDs are U2's *Rattle and Hum* and Rage Against the Machine's *The Battle of Mexico City*. They both sound like somebody just took a stereo mix and put some reverb or phasing trickery on them to get things to pop in the surround channels.

What did you do to avoid that pitfall?

I wanted the band to be playing in front of you and not lose any of the impact it would have if it was in stereo, but at the same



time I wanted to immerse you in the crowd. When we recorded the audio for this DVD, we set up a series of stereo microphones throughout the concert venues, all at different distances from the stage. Because of that, we found that when we started positioning things around the surround field, we didn't need to rely on reverb to "set" the space. When you listen to a powerful stereo mix, you're not missing those "extra" speakers; it sounds great as is. So I didn't want to get too distracting with the surround-channel speakers. This DVD may not be the most creative in terms of abstract use of six speakers, but that wasn't the goal. It's a live show, and I wanted it to remain a live show.

Is there a "wrong" way to do surround?

No. However, I do believe there are *mistakes* that you can make with surround. One giant mistake is that some people put the lead vocal dry in the center channel. I recommend checking out Metallica's *Cunning Stunts* and the recent Rolling Stones live DVD [*Bridges to Babylon Tour '97-'98*] to experience that. As a singer, I can assure you, I *never* want anyone to hear my lead vocal dry, *especially* live. I don't think Mick Jagger even realizes that you could turn off all the other speakers and just listen to that one. Even if you're a good musician, that naked, dry, ugly sound can be very unforgiving.

(mermaids), magic helmets, circles of fire, and the all-powerful ring itself.

Directed by French film auteur Patrice Chéreau (*Queen Margot*), the cycle features a dramatically convincing cast brilliantly led by conductor Pierre Boulez. And the list price of \$120 is less than the cost of a good seat at the Met or the Seattle Opera for just *one* of the four operas: *Das Rheingold*, *Die Walküre*, *Siegfried*, and *Die Götterdämmerung*. Each of them can also

be purchased separately if you prefer to get your feet wet in the Rhine more gradually.

— Robert Ripps

Divx Redux?

Remember Circuit City's attempt at creating a limited-play variant of the DVD format? Saying that Divx, as it was known, "failed to gain consumer acceptance" is an understatement. It caused a tremendous backlash, with people seeing Circuit City as some kind of Big Brother

trying to monitor and restrict what they could watch.

So we wonder what the reaction will be to the next version of limited-play discs. SpectraDisc has received a U.S. patent on a DVD coating that makes a disc self-destruct after a predetermined length of time once its package is opened. Playable time — which can run from minutes to weeks — can be controlled, it says, by modifying the chemical composition of the coating. SpectraDisc sees these suicidal DVDs as “a compelling alternative to video rental.” But it doesn’t seem very friendly to the environment to toss a disc in the trash after one or two plays instead of returning it for someone else to rent.

Better Than a Floppy

When I stumbled over several boxes of 3½-inch floppy disks in my home office recently, I realized that they’re every bit as obsolete as the few dozen 8-inch floppy diskettes I still have in a box in my basement. Many new computers don’t even have floppy drives, so we rely on Zip disks and e-mail to move files between non-networked machines. But not all computers have Zip drives, and many files are too big to transmit easily. So I was intrigued by a small device (shown actual size at right)

Parental Controls

Even if your children *aren’t* lying alcoholics who watch obscenity-laced DVDs and don’t tell you where they’re going, you might find parenting help from some of the electronic tools that were introduced at the 2002 Consumer Electronics Show (see page 76 for more on CES).

As far as drinking liquor and telling lies, DreamQuest Technology (edreamquest.net) had a pair of gadgets, available now, that no enforcement-minded parent should be without: the Digital Alcohol Breath Tester (\$120) and the Truster Portable Lie Detector (\$90). With the breath tester, you blow into the mouthpiece, and a few seconds later it displays your blood-alcohol percentage. With the lie detector, you speak into the built-in microphone, and the device detects above-normal stress that could indicate dishonesty.

If your kid fails these tests, or you just want to know where he or she is, there’s the GPS Personal Locator (\$400) from Wherify Wireless (wherifywireless.com). The bracelet pager has a built-in emitter that can be picked up by a PCS cell-phone



Mary Lou Retton extolls the TV Guardian technology at CES.

network. A parent who subscribes to the service — expected to be available this year for \$25 to \$35 a month — calls a toll-free number or goes online to request a location report. The service combines PCS and GPS data to determine the wearer’s location, which is then conveyed over the phone by an operator or displayed on the

Web with a map. Wherify says that the GPS Personal Locator is also useful for keeping track of Alzheimer’s patients and pets.

If you can’t always monitor the videocassettes and DVDs your children watch, Sanyo is offering four players with a Foul Language Filter: a DVD/VCR combo (\$230), a DVD player (\$140), and two VCRs (\$80 and \$70). Originally available in the TV Guardian (TVG) set-

top box from Principle Solutions, the filter looks for certain words contained in the closed-caption signal and automatically mutes the audio. Olympic gold medalist Mary Lou Retton appeared at the Sanyo booth and declared, “I stand up here as a spokesman for TVG but, more important, as a mother.” Three of the Sanyo products were expected to reach stores in April, the combo player in May. — Michael Antonoff

that offers a way to transfer files between *any* modern computers: the USBDrive from JMTek (usbdrive.com).

The “drive” (it actually contains flash memory) will work with virtually any computer that has a USB port. Rated for Windows 98 SE or later, it’ll also work with

recent versions of the Macintosh and Linux operating systems.

The sample I used holds 16 megabytes (MB) and sells for \$40, but they’re available in capacities up to 1 gigabyte for \$900.



A perfect example of how the USBDrive can act as a bridge: I’d transferred 16 MB of digital photos from my camera to my laptop using a Memory Stick, but it’s the only PC I have with a Memory Stick slot. To transfer them to another computer, I simply dragged and dropped them onto the USBDrive, carried the drive to my other PC, and reversed the process. Simple. And since my second PC was running Windows ME and the device is compatible with the USB standard for mass data storage, I didn’t even have to install a driver for it — the same holds for Windows XP, Win 2000, and Mac OS 9.0 and higher.

— B.C.F.

Winners Take All!

That is, all the Top 10 (actually 11) DVDs and Top 10 (actually 11) CDs of 2001 named in the February/March **S&V** Entertainment Awards. Thanks to the multitude of readers who answered our challenge to send in their own lists, though only two could be chosen (at random) to receive our selections. And they are: Lance Files of Glendale, CA, who won the DVDs, and John Sacksteder of Shelbyville, KY, who won the CDs. Congratulations! We also promised to print the winners’ lists:

Lance Files’s Top 10 DVDs of 2001

1. *Citizen Kane*
2. *Snow White and the Seven Dwarfs*
3. *Lawrence of Arabia*
4. *Rebecca* (Criterion Collection)
5. *Superman*
6. *Moulin Rouge*
7. *Monty Python and the Holy Grail* (special ed.)
8. *Almost Famous, Untitled: The Bootleg Cut*
9. *Shrek*
10. *The Godfather Collection*

John Sacksteder’s Top 10 CDs of 2001

1. Buddy Guy: *Sweet Tea*
2. Ryan Adams: *Gold*
3. John Hiatt: *The Tiki Bar Is Open*
4. Natalie Merchant: *Motherland*
5. Bob Dylan: *Love and Theft*
6. Lucinda Williams: *Essence*
7. John Mellencamp: *Cuttin’ Heads*
8. Ike Turner: *Here and Now*
9. Pete Yorn: *Music for the Morning After*
10. Shawn Colvin: *Whole New You*



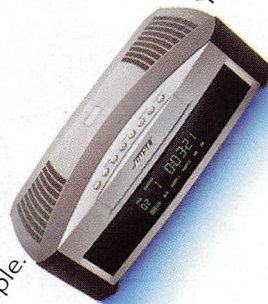
WIRES



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XM Rocks

I recently had a Pioneer XM satellite radio installed in my pickup ("XM Rated," February/March). Since I live on the outskirts of Connecticut, I was skeptical about how good the reception would be. But after almost a month of XM, I can tell you it rocks! I'm thrilled. And I don't mind paying the subscription fee because now I can listen to the music I like without having to deal with a lot of commercials and talk. For about \$10 a month, or \$2.50 a week, you can hardly get as much value anywhere. I spend that much for a movie ticket or a couple of magazines. And I only lose reception with the occasional building or bunch of trees. The tuner even received a perfect signal in pea-soup-thick fog. Music fans — freedom is here.

Mark Springer
via e-mail

Welcome to My DVD-Audio Nightmare

I was happy to read that Alice Cooper's *Welcome to My Nightmare* had been released on DVD-Audio, since it's one of my favorite albums from the '70s. But upon listening to it, I found it wasn't the same album at all. Alternate lyrics and less objectionable versions of songs were used in combination with the original material to create a different mix. Some fans might like this disc for their collections, but with no mention of these differences on the packaging, I feel cheated.

Harvie Walle
Vancouver, British Columbia

After reading all the raves about DVD-Audio, I finally got a player. My very first DVD-Audio disc was Bjork's *Vespertine*, but when I went hunting for more good recordings, the reality of buying into an emerging technology set in — most of the titles were classical. The number of DVD-Audio discs from pop albums recorded within the last 25 years can be summed up with both hands and two or three of my toes.

True, there are a few goodies, including the Doors' *L.A. Woman* and Fleetwood Mac's *Rumours*, but where are the true rock masters, like Pink Floyd? And an entire genre that was seemingly born to fit this wonderful format has been overlooked — the electronica of such artists as Enigma, Delerium, Enya, and Moby. Even the casual listener can tell from the stereo mixes that their recordings are just perfect for DVD-Audio.

I'm no sound wizard, but I *do* know marketing since that's my profession. And right now, from a marketer's point of view, the future of the DVD-Audio format (and SACD,

for that matter) is looking very, very bleak due to the record labels' inadequate marketing and product development. In hindsight, I can now say I'm disappointed that I spent the extra bucks to buy a DVD-Audio player. But at least I'm not as disappointed as the companies that've sunk tens of millions of dollars into this half-assed effort are going to be.

E. Y. N. Lai
via e-mail

HDTV Copy Protection

The "Interface-off" section of Al Griffin's "HDTV: The Year in Review" (February/March) contained some important information for those thinking of taking the HDTV plunge. At the same time, though, it raised a lot of questions. Can we assume that TVs with FireWire or DVI inputs will decode the respective copy-protection schemes (DTCP or HDCP)? Is this likely to turn into a copy-protection format war, with one input eventually becoming obsolete? And what about the ability of broadcasters, at the request of content providers, to lower the resolution of a set-top box's analog outputs? I want to buy a set now, but I don't want to be stuck with an analog-only component monitor.

Doug Lehman
Leonardtown, MD

Al Griffin responds: It's pretty safe to assume that a TV equipped with FireWire or DVI will be able to decode signals encrypted with the copy-protection scheme associated with either type of connection, but you'd need a crystal ball to predict whether one interface will win out or both will co-exist. What we can report is that manufacturers displayed prototypes of digital sets and set-top boxes containing both DVI and FireWire at the recent Consumer Electronics Show (see "CES Showstoppers," page 76). As for whether content providers will restrict the resolution of set-top boxes with component-video outputs, we sincerely hope Hollywood isn't arrogant enough to push a scheme that would render obsolete the more than two million digital TVs that are currently in people's homes.

Where's the Babel Fish?

When your movie reviews indicate a foreign language, I don't know if the soundtrack of the DVD is in that language or if there will be subtitles or dubbing in English. Please make this clearer.

Ron Tancredi
via e-mail

Since space is limited, when we review a foreign film we list the language the main soundtrack is in and leave it as a given that English subtitles are available. If there's also an Eng-

lish-dubbed soundtrack, we list that after the original language. In the rare instances when only an English-dubbed soundtrack is available, or when there's an alternate version of the film with the actors speaking English, we note this in the body of the review.

Apex AD-7701 Redux

In his review of the Apex AD-7701 DVD-Audio/Video/SACD player (February/March), David Canada states: "Except for Pioneer's latest ultra-deluxe flagship receiver, no current A/V receiver I know of has channel-level controls on its multichannel analog inputs." I have the six-channel analog output from a JVC progressive-scan DVD-A/V seven-disc changer going into the corresponding inputs of a Denon AVR-3801 receiver. When I'm playing DVD-Audio discs (and the player's blue light indicates I'm actually *hearing* DVD-Audio), I can adjust the levels for each channel, including the subwoofer, through the receiver. I can also adjust the bass and treble. Of course, I don't have any bass-management capabilities, but I'm fortunate enough to have full-range Mission towers with which to hear the splendor of DVD-Audio.

Chad Bobik
Ft. Lauderdale, FL

Having individual channel-balance controls on the receiver's outputs instead of its multichannel inputs will help you set correct levels for DVD-Audio playback, but only if you accept that you may have to rebalance the system whenever you switch to a source with different inherent levels — like Dolby Digital or DTS soundtracks decoded by the receiver.

Krall in Favor

In 1956, I was 17 and listened to Julie London's *Julie Is Her Name*. I thought it was simply great! In 2001, I listened to Diana Krall's *The Look of Love*. I thought it was simply great! All of this technical stuff is just so much baloney. A great voice is a great voice is a great voice. Krall has what it takes, and I suspect I'm just one of millions who think so.

I like her photos, too. Yeah!

Jerry C. Vincent
via e-mail

See page 113 for another reader's rebuttal to Francis Davis's December 2001 review.

Test-Tone Trouble

I just got the *Sound & Vision Home Theater Tune-up* DVD and went through it from start to finish. However, I noticed when I calibrated my speakers using the test tones on the disc and a sound-level meter that they differed by a considerable amount (about 5 dB)



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feedback

from the previous settings I'd made using the test tones from my receiver. Why is this happening, and which test tones should I use? Could it be because the speakers don't match tonally?

Charles Wolinski
Elkton, MD

Technical editor David Ranada replies: I assure you that the tracks designated on the disc for level balancing are balanced. Without more information about your setup, it's impossible to say why the discrepancy you noted occurred. The tones to use, however, are the ones on the disc since they take the same path through your system as DVD soundtrack signals.

Copy-Protected CDs

If the next generation of CDs are copyproof, will the industry make special CD players to accommodate them? Your review of the Philips CDR820 recorder (January) said that it couldn't play the Charlie Pride disc, nor could most DVD players you tried. Why would anyone want to buy a piece of equipment that can't play a new CD? How about requiring a label that says "Will play old CDs only"?

Robert Austin
via e-mail

I'm so excited! Now that the first copyproof CD has been released, I'm hoping that soon all CD releases will have copy protection. Since I can't make a copy of any copyproof CD or rip it into an MP3 or record it onto a cassette, I should be able to return it and get my money back if it stinks. Right?

Vince Fonte
Copley, OH

Uh . . . probably not. For the latest news on CD copy protection, see "Access Denied," page 87.

Burning Questions

In David Ranada's comparison of DVD recorders ("Opening Moves," February/March), he doesn't mention whether he tried to connect any of the decks to a PC. This left me wondering if any of these \$2,000 standalone DVD recorders perform all the functions of a \$500 DVD burner hooked up to a PC.

For example, if I connect one of these recorders to the FireWire port on my PC, can I burn a movie DVD from AVI or MPEG-2 files stored on my PC that will play in my home theater DVD player? Can I burn music CDs that will play in either my home theater DVD player or the DVD-ROM drive on my PC? Can I create data DVDs or CDs containing AVI, MPEG-2, or JPEG files that will play in my computer's DVD-ROM drive?

Gary Vrooman
Los Angeles, CA

David Ranada replies: None of the DVD recorders I tested create "data" discs, nor can

they burn anything onto CDs. Only the Philips and Pioneer machines have FireWire inputs, and we've only just started investigating computer/DVD-recorder "interoperability" (see my test of Sony's Vaio PCV-MXS10 on page 72). All I can say right now is that you can digitally copy the video contents of a non-copy-protected DVD played on the Pioneer to a computer's hard drive.

Go, Video

Michael Antonoff's review of the Go-Video DVR4000 combo DVD/VCR (January) was very informative in pointing out the product's limitations, even if you did have to read between the lines. If I read correctly, two of its most appealing features — MP3 playback and the DVD-to-VCR copy button — are crippled and pretty much useless. I can remember the Go-Video dual-deck VCR ads from years ago, which boldly stated "copy even tapes that are copy protected." What was the reason for the company's change in stance on the DVD models? And what practical use is MP3 playback for "factory-pressed discs only"? (We all know how much the record industry loves to distribute MP3 discs!)

Brian Siler
Collierville, TN

Michael Antonoff replies: Specifically because the DVR4000 won't play MP3 tracks on recordable CDs, Go-Video does not make any claims about the DVD player's MP3 compatibility. The DVR4000's limited MP3 playback is an undocumented feature that I discovered. I agree that your chances of being able to find a selection of factory-pressed MP3 discs are small because the format has never been supported by major music labels — only by Internet sites that help promote unknown bands by issuing their MP3s on CD. (I have several such discs.) As for being able to copy DVDs to VHS tapes, the DVR4000 won't help you break Hollywood's copy-protection scheme. The feature will work, though, for non-copy-protected DVDs, including some adult titles as well as home videos transferred to DVD.

High-Definition DVDs

As an owner of a high-definition TV set, I'm curious why there isn't a high-definition DVD player or high-def discs. The DVD format offers 480 lines of vertical resolution. Why not 720 or 1,080 lines? I know you'd need more data room on the disc to provide that kind of resolution, but a lot of the extras they put on DVDs aren't needed. Take out the subtitles, the extra footage, the option to listen to a movie in foreign languages, and use both sides of the disc. I'm sure there'd be a way to down-convert a high-res movie to be backward-compatible with non-HDTV sets. Does this technology not yet exist, or are the manufacturers

waiting for other compression technologies to come along?

Matt Mullaly
via e-mail

The DVD format, introduced before digital and high-definition TV, was designed to be compatible with analog TV, so video is stored on DVDs in the same 480i (interlaced) format used for analog TV. The 480p (progressive) output of progressive-scan DVD players is obtained by "deinterlacing" the video frames on the disc. Downconverting a 1080i- or 720p-format signal from a high-def DVD for viewing on a non-HDTV set would, indeed, require some kind of format converter.

But resolution is only one issue. The other is data density. Dropping extras to add space for a higher-quality image is already being done on the Superbit DVDs of some movies, like Bram Stoker's Dracula (see "Reference DVD," page 110). But that alone will never be enough — without at least twice the density of a standard DVD, you can't fit more than half of an average-length high-definition movie on a disc. Many movies would need not just two layers but two discs, and standard DVD players wouldn't be able to read high-density DVDs at all. High-def DVD is in the works, but don't expect to see the new players and discs for at least a couple more years (see "Home Theater," page 37, for more on this).

LCoS DOA?

Last year's big news at the Consumer Electronics Show was RCA's "available this summer" L50000 liquid crystal on silicon (LCoS) HDTV. But that set has yet to be released and was conspicuously absent from this year's CES show. Is this technology DOA, or what? I've been waiting a year now to check out the LCoS set. Am I wasting my time?

Vincent Lo Presti
Huntington, NY

A Thomson/RCA representative told us as we went to press in February that RCA planned to distribute a limited number of L50000 TVs by the end of March. The reason for the delay, he said, was that LCoS technology is "much more complex than we first thought," so the company can build only a few of the sets at a time. LCoS wasn't entirely absent from CES 2002, however — Toshiba introduced a 57-inch LCoS set (the release date had not been determined by presstime).

S&V

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Harman Kardon

You'll feel surrounded by surround sound choices with Harman Kardon's AVR 520. The receiver decodes Dolby Digital and DTS 5.1- and 6.1-channel soundtracks, including DTS-ES Discrete. You'll need an outboard amp if you have one or two back surround speakers, though, as there are only five powered channels, rated to deliver 75 watts each into 8 ohms. The AVR 520 also has Dolby Pro Logic II, DTS Neo:6, and Lexicon Logic 7 processing to create surround sound from two-channel sources, plus Hall and Theater modes. Routing HDTV or progressive-scan video from a DVD player through the receiver is no problem thanks to its two wideband component-video inputs. There's also a six-channel analog audio input for a DVD-Audio or Super Audio CD player, five S-video inputs, and six digital audio inputs (three optical and three coaxial). Automatic level calibration makes setup a snap. A backlit, eight-device universal learning remote control is supplied. Price: \$999. www.harmankardon.com, 800-422-8027

Cerwin-Vega

Six easy pieces — four left/right satellite speakers, a center speaker, and a powered subwoofer — make up Cerwin-Vega's AVS-632 home theater speaker system. Each L/R satellite has a 4-inch woofer and a 1-inch Mylar-dome tweeter, while the center has dual woofers. All have a rated frequency response of 80 Hz to 20 kHz ± 3 dB. Powered by a 100-watt amplifier and rated down to 35 Hz, the 12½ x 14½ x 13¼-inch down-firing sub has an 8-inch driver, a variable crossover, a phase switch, and a level control. All of the magnetically shielded cabinets are finished in graphite with perforated metal grilles. Price: \$449.

www.cerwin-vega.com, 805-584-9332



RCA

Able to operate up to nine devices, RCA's RCU1000B touchscreen controller will have a lonely life as the only remote left on your coffee table. The LCD measures 4½ x 2½ inches and can show up to 40 virtual keys along with a date and time indicator. Nine macro keys can each store up to 20 keystrokes, letting you turn on or shut down all your gear with one touch of the supplied stylus. You can set up the RCU1000B to use codes preprogrammed in its database or teach it commands for a given component by placing the old remote head to tail with it and programming the keys individually. A built-in sensor turns on backlighting in low light. Price: \$129. www.rca.com, 800-336-1900

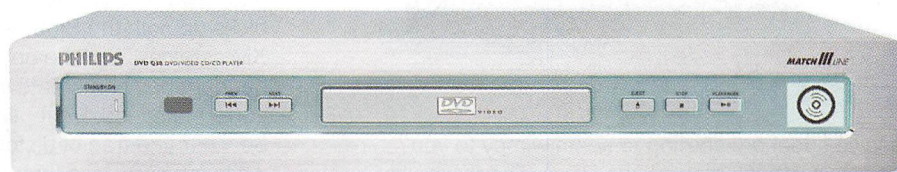
Samsung

Computer monitors using thin, flat LCD panels are on their way up in size, as evidenced by Samsung's 21-inch (diagonal) 211MP and 24-inch 241MP (shown). Depth is only 2 $\frac{5}{8}$ inches with the stand, which can be removed for wall placement. Both monitors are HDTV-ready and have a built-in NTSC tuner and RGB+H/V, component, composite, and S-video inputs as well as a VGA input. The viewing angle is said to extend to 170°, and contrast ratio is rated as 500:1. Maximum resolution on the 211MP is 1,600 x 1,200 pixels, while the 241MP's is 1,920 x 1,200 pixels. A built-in zoom can magnify any part of an image up to 17x. The supplied speakers can be affixed to the sides of the display. Prices: 211MP, \$4,999; 241MP, \$6,999. www.samsungusa.com, 800-726-7864



Allison

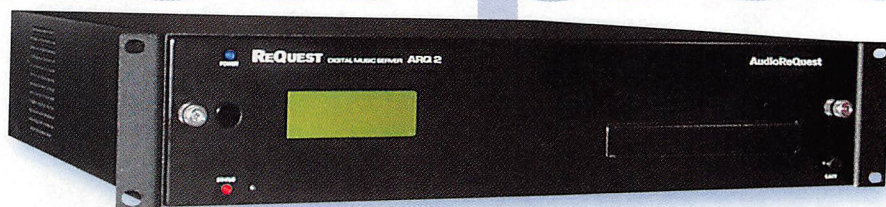
Allison Acoustics went out of business in 1989, but now its acclaimed speakers are being produced once again by a new company, with veteran speaker designer Roy Allison again serving as chief acoustic engineer. The product line is led by the Allison One, which he created in 1974 and updated in the 1980s. The new One has the same three-way design with a 10-inch woofer, a 3 $\frac{1}{2}$ -inch midrange driver, and a 1-inch tweeter on each of two sides of the triangular cabinet, which is designed to be placed as close to a wall as possible. Frequency response is rated as 36 Hz to 20 kHz +1, -3 dB. Finished in your choice of cherry, walnut, oak, or other hardwood veneers, the speaker measures 19 x 41 $\frac{3}{8}$ x 11 inches and weighs 75 pounds. Price: \$6,000 a pair. www.allisionacoustics.com, 877-813-5878



Philips

Looks aren't everything, but they count for quite a bit with Philips. Its attractive DVDQ50 DVD player is not only a mere 3 inches tall but also has two component-video outputs, one of them offering progressive-scan images with 2:3 pulldown. The player can read both CD-Rs and CD-RWs, even MP3 files. Built-in Dolby Digital and DTS decoders provide 5.1-channel sound through the multichannel analog output, and if you don't have surround speakers, TruSurround processing will simulate them. There are also coaxial and optical digital audio outputs. A bit-rate indicator lets you know just how many little ones and zeros it takes to create the image you're watching. Price: \$499. www.philipsusa.com, 800-531-0039

NOTE All prices and product information are supplied by the manufacturers. Dealer prices may vary.



ReQuest Multimedia

In the ARQ2-Pro, its next-generation digital audio server, ReQuest Multimedia has added the option of storing music as uncompressed WAV files and has also provided coaxial and optical digital outputs. And now when you want to enter artist and title data for a recording, you can first check the onboard CD Lookup database before visiting Gracenote.com. You rip songs from the built-in CD player to a hard drive of at least 40 gigabytes (GB), which holds about 300 hours of MP3 audio encoded at 128 kilobits per second (kbps). Prices: with 40-GB drive, \$2,950; with 60-GB drive, \$3,500; with 100-GB drive, \$5,000. www.request.com, 800-236-0802

Rockford Fosgate

The Rockford Fosgate RFX9210 car CD receiver doesn't just play discs with MP3 files — it makes them feel at home. Its Track Access and Root keys let you select songs by assigned numbers or instantly return to the disc's root menu. No disc handy? The tuner has 20 FM and 10 AM presets, and there's an auxiliary input for an external source. The amplifier is rated to deliver 30 watts each to four channels, and there are three pairs of preamp outputs. The faceplate slides off at the touch of a button, and a remote control is supplied. Price: \$500.

www.rockfordfosgate.com, 800-366-2349



Canton

Passive speakers starting to seem wimpy to you? Get active with Canton's Ergo RC-A. The three-way floor-standing speaker has dual 9-inch woofers powered by a built-in 350-watt amplifier as well as a 7-inch midrange driver and a 1-inch aluminum-manganese tweeter powered by your receiver or system amplifier. Bandwidth is given as 18 Hz to 30 kHz. The bass-reflex cabinet is finished in black ash, cherry, or beech veneer and features a removable perforated-steel grille (not shown) and rounded wood corners. Height is 45¼ inches, and weight is 73 pounds. Price: \$3,500 a pair.

www.cantonusa.com, 612-706-9250



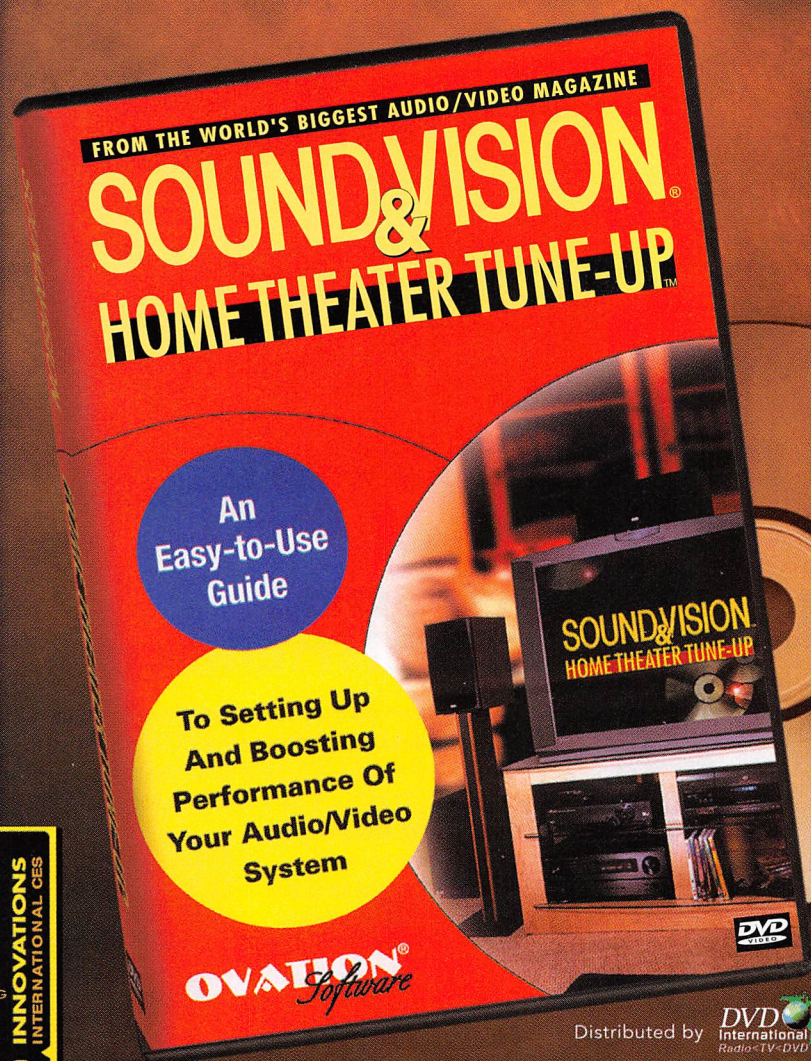
Head Wave

Drivers can't have all the fun — now pedestrians can enjoy satellite radio, too, with Head Wave's APR-1 satellite-antenna headgear. The receiver picks up both the Sirius and XM services, and the optional headphones can create virtual surround sound. Reception is said to be clear and free of distortion even while jogging — as long as you don't turn east. The adjustable band in back of the helmet ensures that one size fits all, and it comes in black, graphite, and Midnight Sierra finishes. The headgear is powered by a dozen D-cell batteries and weighs only 75 pounds. A neck brace is supplied. Price: if you have to ask . . .

www.aprilfool.com, 888-UNN-REAL



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The \$699 XLN-6 speaker system from Cadence offers home theater sound at a very comfortable price. The XT-1 front left/right satellite has a 6½-inch woofer, a 1-inch tweeter, and a bandwidth of 65 Hz to 20 kHz. The XC-1 center speaker and XS-1 surrounds have 4-inch woofers. The XLNS-8 subwoofer, rated down to 35 Hz and measuring 10 x 13½ x 13¾ inches, has an 8-inch down-firing driver along with a variable crossover, phase switch, and level control. All of the magnetically shielded satellites have spring-clip connectors and come in black. The sub has spiked feet and is finished in dark woodgrain vinyl.

www.cadencesound.com, 800-477-2328



JVC

The widescreen 48-inch l'Art Pro rear-projection HDTV monitor from JVC shows you can have high-def TV without high-debt prices. In addition to two wideband component-video inputs, there's a DVI (Digital Visual Interface) connector for hooking up a digital VCR or high-def satellite receiver as well as four composite- and three S-video inputs. A built-in upconverter bumps all signals up to the set's native 1080i (interlaced) display format. There's also a center-channel input so the TV's stereo speakers can function as a dual center speaker, two NTSC tuners, and a 3-D digital comb filter. Price: \$2,300. www.jvc.com, 800-526-5308



Wood Technology

If you're worried that sound reflections inside your walls may degrade the performance of in-wall speakers, Wood Technology's Sound Chamber wall insert may be the ticket. The 7¼ x 12 x 4-inch device, which fits behind and around a 5-, 6-, or 8-inch in-wall speaker, is said to suppress reflections inside the wall cavity. The V-shaped grooves are said to let bass frequencies escape so the entire wall can produce deep bass. Each Sound Chamber disassembles into four pieces to ease fitting it through your wall cutout; it's held between the studs by tension — no installation hardware needed. Price: \$70 a pair. www.wood-tech.com, 888-445-5520



Aragon

Aragon's Stage One, in either black or silver finish, has it — THX Ultra2 certification, that is. It's the latest thing, and all the cool gear is trying to get it. The preamp/processor can decode Dolby Digital Surround EX and DTS-ES soundtracks into 6.1 channels, plus it's got wideband component-video connections for HDTV signal switching. The crowded back panel has component-, composite-, and S-video jacks along with coaxial and optical digital audio inputs. An AM/FM tuner is onboard. A preprogrammed/learning remote control is supplied, and an RS-232 port allows for future software upgrades. Price: \$4,000. www.aragonelectronics.com, 866-781-7284

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- Joe Hageman, Sound & Vision on the Cinema HT



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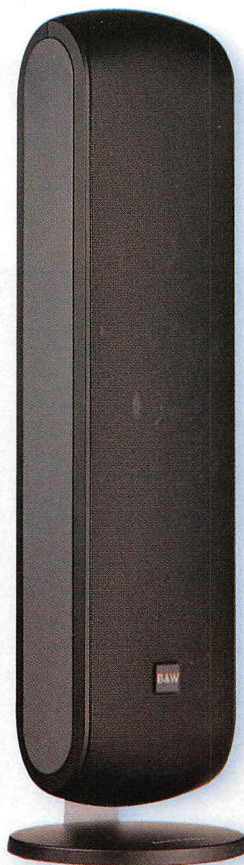
Inline

The Digital Visual Interface (DVI) is slowly expanding into more home-entertainment products, and Inline's IN1408 video scaler is said to be the first with DVI connections. In addition to digital video through two DVI jacks, its eight inputs can accept virtually any analog video signal. Besides one DVI output, two analog video outputs provide RGB (in several flavors) or component signals, all scaled properly for your DLP projector or plasma TV at resolutions from 640 x 480 to 1,600 x 1,200 pixels. Interlaced signals from film-based sources receive automatic 2:3 pulldown during upconversion. Four of the inputs accept both analog stereo and coaxial digital audio; all three outputs include both. Price: \$5,200. www.inlineinc.com, 800-882-7117



Esoteric Audio

Available in lengths from 3 1/4 to 16 1/2 feet, Esoteric Audio's CVK1, CVK3, and CVK4 component-video connector kits each have three color-coded cables for transmitting video signals. The CVK1 cables contain oxygen-free copper conductors separated by a polyethylene dielectric. The CVK3 cables have shielding that combines copper-Mylar foil with a tight copper braid, which is meant to reduce noise caused by radio-frequency interference. And the CVK4 cables use Ultra-Grain copper with elongated copper "grains," said to reduce signal degradation. Prices: \$30 to \$134. www.esotericaudio.com, 800-806-6111



B&W

Expanding its Leisure Monitor line, B&W introduces the VM1 speaker, designed for both home theater and stereo systems. The slim two-way design, with a long-throw 5-inch woofer and a 1-inch tweeter, is rated for a frequency response of 75 Hz to 20 kHz ± 3 dB and a sensitivity of 91 dB. Weighing in at only 6 pounds, the speaker measures 5 x 20 5/8 x 3 3/4 inches, including its removable "foot." The vented enclosure comes in a black, white, or silver finish. Price: \$800 a pair. www.bwspeakers.com, 978-664-2870

Runco

At the heart of Runco's DR300 video projector lies Texas Instruments' single-chip Digital Light Processing (DLP) technology, which uses thousands of tiny micromirrors to display images at 1,024 x 768-pixel resolution. The projector's contrast ratio is rated as 800:1, and it can accept high-definition TV signals through its RGB+H/V or wideband component-video inputs. It also has jacks for composite- and S-video. The projector can be paired with Runco's optional PFP (pixel-for-pixel) controller (\$3,000), which scales standard signals to precisely match the native resolution of the projector and passes high-def signals with no processing. Price: \$8,997. www.runco.com, 800-237-8626



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- Andrew Marshall, Audio Ideas Guide on the Stylus® 100



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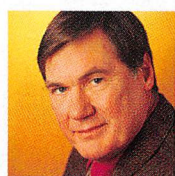
HDTV or Not HDTV?

Q. I'm looking to replace my 36-inch direct-view TV with a big-screen rear-projection set, something around 50 inches. I also have a digital satellite system and a DVD player. Should I spend \$1,200 on an analog TV or \$2,300 on a high-definition set?

Mike Long
Madison, WI

A. If your budget can handle it, I'd definitely recommend the high-definition set.

Expert advice
on everything
about home
theater, audio,
and video.



While there are superb analog sets out there, an HDTV will offer you the best picture and the most flexible connection options. And the future is digital, so you're eventually going to have to upgrade. If you plan to replace the TV now in any case, think about your requirements down the road. Even if there are no over-the-air HDTV

broadcasts in your area yet, you can at least get what your satellite provider offers.

Sounds Like Separates

Q. I have a DVD player with a Dolby Digital decoder, but I don't have a digital surround receiver. To get surround sound, I feed my player's 5.1-channel analog audio outputs to three integrated amplifiers. I connect the front left, center, and right channels to the first amplifier, the surround channels to the second, and the passive subwoofer to the third. I'm filled with awe by the resulting sound, but I haven't been able to compare it with a system using a receiver with a Dolby Digital decoder. Am I missing something?

Jun H. Moscoso
Davao City, Philippines

A. Generally, using separate amplifiers to power the various channels in a surround system works well as long as they are reasonably well matched in terms of power and their levels are matched carefully (use a test disc if there are no internally generated tones). One thing to be careful about is the relative phase of the speakers across the front. Some amplifiers invert phase from input to output, while others do not, so if

you've mixed the two sorts, you're likely to create some strange audible artifacts. The cure is to reverse the polarity on the center speaker (presumably the left and right will be in phase with one another if you've wired them up properly).

In your case, however, unless the amplifier used for the front channels is a three-channel model — a rare bird — you may have compromised some of the benefits of the Dolby Digital decoding process by wiring all three to a two-channel amplifier. I would suggest using amplifier No. 1 for the left and right, amp No. 2 for the surrounds and amp No. 3 for the center and passive subwoofer. This mirrors the circuit layout in many A/V receivers.

Disc vs. Drive

Q. My 200-disc CD megachanger has stopped working. Should I purchase another megachanger, or would it be better to purchase an audio hard-disk recorder and transfer all the music on my CDs to it in a compressed format?

David E. Witt
Covington, KY

A. The tradeoff is basically between storage space and sound quality. It's tempting to be able to cram an enormous amount of material into a small storage space, and compression would let you do that, but compressed audio files don't necessarily sound the same as the original CDs. Still, compressed audio *can* sound very good, especially at the higher bit rates (above 128 kilobits per second for MP3), and some sacrifice in quality might well be worth it for the gain in convenience.

Camcorder Pixels

Q. If the horizontal resolution of a digital camcorder format is on the order of 500 lines, shouldn't the 480,000-pixel or so image sensors used in a number of camcorders be more than enough to capture that amount of detail? Correct my math if it's wrong: 500 vertical x 500 horizontal pixels = 250,000 pixels. Isn't that plenty for 500 lines?

Steve Petrou
Toronto, Ontario

A. Not every pixel in an image sensor contributes directly to resolution. Three-chip models deliver the highest resolution by using a prism to split the incoming light

into red, green, and blue components and routing them to dedicated image sensors. In less expensive single-chip cams, however, the sensor picks up three colors, so in the worst case a 480,000-pixel image sensor will produce 160,000 pixels of resolution. In practice, it's not as bad as that. Also, the electronic image-stabilization features in digital camcorders can further reduce resolution by using only a subset of pixels on the sensor to record images.

Fake-Looking Effects

Q. I love the high image quality of DVDs, but, paradoxically, most movie special effects seem to suffer. Scene backgrounds look like paintings, and computer-generated images look artificial even in new releases. I know the effects blended realistically in the theater and on VHS. Is my system at fault? Or if it is a general problem, are the studios doing anything about it?

Devin Sloan
Los Angeles, CA

A. That's the joy of new technology: it shows up the flaws in the old. With movies, the low resolution of videotape concealed numerous fakes, which were often not easily visible in theaters either. Even pristine film can be pretty fuzzy as projected in the local megaplex.

I don't imagine it'll take Hollywood long to refine effects techniques to meet DVD standards, but what's *already* on film won't get any better. On the other hand, to get the best possible images from a DVD, you'll have to adjust the picture controls on your TV. Turning down the contrast often helps as well as adjusting other settings using test DVDs like Ovation Software's *Avia* or S&V's *Home Theater Tune-Up*. **S&V**

Have a question about audio, video, or home theater? Send e-mail to soundandvision@hfmus.com (put "Q&A" in the subject line) or regular mail to Q&A, Sound & Vision, 1633 Broadway, New York, NY 10019. Please include your name, street address, and phone number for verification; only your name, city, and state/country will be printed. Sorry, but only questions chosen for publication can be answered, and all letters are subject to editing at our discretion.

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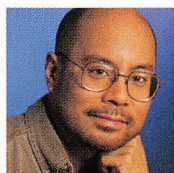
Legacy Audio, Inc., Springfield, IL, USA (217)544-3178

Wild Blue, Yonder

Okay, I know I shouldn't gloat. But I told you so. In a keynote speech at the National Association of Broadcasters (NAB) annual convention a year ago, I warned that if the broadcast and cable industries didn't get their act together when it came to putting high-definition signals out there in a big way, high-def programming would be provided by other means. If a packaged HDTV medium became available, I predicted, its breathtaking, commercial-free imagery would persuade people to watch less broadcast and cable TV, something those viewer-strapped media could ill afford. That new medium has arrived.

But it wasn't announced at January's Consumer Electronics Show (CES). There the focus — literally and figuratively —

I love it when a new consumer-electronics device takes advantage of a fundamental physical process.



was on blue-light lasers, which can be focused onto a far smaller spot than a normal DVD player's red laser, thereby making high-data-density HDTV recorder/players possible. At CES, some companies exhibited operating prototypes of such machines, while others showed only some crucial internal parts. Panasonic showed just its blue laser. It didn't look

like much on the outside, but it turned out to be the most interesting device of all. I always love it when a new consumer-electronics device is based on a fundamental physical process — that's what "technology" is all about. The last time this occurred with a recording system was when the faint magneto-optical Kerr effect — in which the polarization of a light beam is very slightly altered by reflection from a magnetized surface — was exploited with enormous success by the MiniDisc format. Panasonic's new blue laser exploits another nonlinear optical effect, second-harmonic generation (SHG).

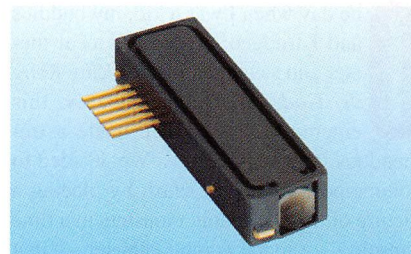
Panasonic's laser assembly starts with an *infrared* semiconductor laser operating at an invisible 820-nanometer (nm) wavelength. Its beam is directed into an "optical waveguide" made of lithium niobate (its chemical formula is LiNbO_3). The wavelength of the emerging light is only *half as long*, or 410 nm, which is visible as a very deep blue. The crystal distorts the beam so much that its second harmonic (twice the frequency = half the wavelength) is the primary waveguide output. Unfortunately, the physics explaining this phenomenon is far too abstruse for these pages. It's almost as mysterious as *Star Trek*'s dilithium crystals.

Use of SHG with an infrared laser has quite down-to-earth benefits, however. The laser's output power is potentially higher than that of intrinsically blue semiconductor lasers (Panasonic has produced 30-milliwatt prototypes on the way to commercialization, as early as 2003, at 50 mW). Infrared lasers are also longer-lived than blue lasers (10,000 vs. 3,000 hours), and the SHG waveguide, being completely passive, will long outlive the attached infrared laser.

Using the new laser assembly, Panasonic has developed a high-def system that can put up to 50 gigabytes on a dual-layer recordable disc. That's enough space to store 4 hours of HDTV material at a data rate of 25 megabits per second (Mbps) — 25% higher than allowed in broadcast HDTV, which means potentially better picture quality. Broadcasters, look out!

An even higher data rate of 28.2 Mbps is achieved by JVC's HM-DH30000U, the D-VHS recorder announced last November. If real, honest-to-god Hollywood studios release high-def movies in the D-Theater format for this machine (see "Random Play," page 16), *that* will be the first packaged medium for high-def video. All videophiles should desire such a development — even if it does use VHS tape.

JVC's D-Theater format exploits something relatively new in consumer electronics, though we aren't talking physics but the arcane mathematics of cryptography. Protecting the precious video data from unauthorized use or duplication are several lay-



Panasonic's innovative blue-laser assembly (shown here about twice actual size) is actually based on a cheaper, longer-lasting infrared laser.

ers of cryptographic security. This isn't going to be broken by some 15-year-old kid from Norway, as happened with the DVD protection scheme. Some of the crypto techniques are new to consumer electronics, and others are relatively new anywhere (like the use of "elliptic curve" calculations).

Though protecting high-def movie data in this way might discourage casual copying, it may not deter for long the pirates bent on mass duplication of prerecorded movies. And no amount of any kind of data protection is going to stop such potentially copyright-infringing uses as charging people admission to watch D-VHS movies on your big-screen surround sound system. How else will you pay for that expensive high-def projector, aside from a popcorn concession charging New York City movie-theater prices of \$4 a bag?

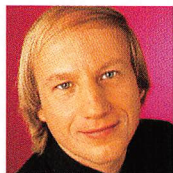
I'm sure of one thing. If the cryptosystem in JVC's D-Theater format is broken in such a way that casual dubbing becomes feasible, it'll probably be a *long* time before we see any other packaged medium carrying HDTV signals. Blue lasers, lithium niobate, second-harmonic generation, and the rest may well have been for naught. No Hollywood studio is going to give away not only the golden eggs but the high-definition goose that lays them. If you want the highest-quality images in your home theater, better hope that JVC's recorder remains secure. Otherwise high-def on *disc* might remain a sparkling visual mirage, beckoning in the distance, out yonder, forever beyond reach.

S&V

King Kong vs. Godzilla

One day when I was a kid, my buddies and I trudged over to the local theater and saw a matinee of *King Kong vs. Godzilla*. Understandably, this cinematic masterpiece made a tremendous impression on us. We decided to commemorate the epic clash by placing a picture of the two titanic monsters in a time capsule — a metal cookie canister — that we buried near Sugar Creek. We agreed that the capsule should remain undisturbed

If CD and DVD — the biggest and baddest A/V storage media to ever roam the earth — fought it out, which would win?



until the Cubs won a World Series. After yet another Yankees victory the following October, and greatly wearied by the concept of eternity, we decided to retrieve the photo, but we couldn't find the damn canister. All of that brings us to the question: If CD fought DVD, which format would win?

These are the biggest and baddest A/V storage media to ever roam the earth. CD dominates the music scene, and DVD rules movies — a head-to-head battle would be an awesome event. To handicap the battle, let's consider four criteria: engineering sophistication, technical innovation, success against competitors, and consumer acceptance.

As impressive as the CD once was in terms of engineering sophistication, in comparison with DVD it's almost as quaint as a slide rule. Yes, DVD players are becoming commodities. But DVD is still about 15 years more high-tech than CD, so it wins the sophistication category without breaking a sweat.

In terms of innovation, the CD was a breakthrough product that single-handedly carried consumers over the digital threshold and brought us such binary and optical delights as easy random access, vanishingly low noise levels, and negligible wear and tear from ordinary handling. Few products

have wrought so much change as the CD. Suddenly, digital was cool — you just weren't happening unless you had "CD sound quality."

In contrast, DVD is a byproduct of CD. Yes, the pits are smaller, the laser wavelength is shorter, there are more data layers, yadda, yadda, yadda. But those are all refinements, not radical innovations.

How have the two titans fared against their competitors? The CD started out slow, but it eventually crushed its competition. The long-play (LP) record had reigned supreme for three decades, but in less than five years CD put it on the endangered-species list. After mopping the floor with the LP, the CD began pummeling the cassette.

But DVD has also kicked some serious booty. The laserdisc was always a weakling, and DVD immediately walked right over it. About 20% of U.S. homes already have at least one DVD player, and disc sales and rentals are thriving. But while it's clear that videotape is technologically passé, DVD hasn't KO'd VHS just yet. More than 200 million VCRs have been sold in the U.S. since the beginning, and sales are still thriving, with a record of 23.1 million units in 2000 and a still robust estimate of 15.7 million for 2001. Yes, DVD players are expected to outsell VCRs this year, but VHS is still huge. If we compare the early years of each format, CD's domination of its rivals is more clear-cut than DVD's,

so CD narrowly takes this category, too.

Finally, what about consumer acceptance? Well, would *you* rather give up CD and go back to LPs, or give up DVD and go back to VHS? Most people, I think, would rather give up DVD. CD is simply so close to indispensable that it wins again.

In an epic clash between the CD and DVD behemoths, with thousands of bystanders fleeing for their lives, the bold and brash DVD would come on strong, confident that as the fastest-growing consumer-electronics product ever, it will win over the aging veteran CD. The CD would absorb DVD's massive body blows, but it's gone up against two of the toughest formats around — the LP and the cassette — and knows how to take punishment. In time, the youthful DVD would exhaust itself, and good old CD would come back strong, picking up DVD, twirling it overhead, and hurling it into Tokyo Bay.

When all is said and done, when all the history books have been written, it will be the CD that wins the most praise. They'll say that DVD was evolutionary, but CD was revolutionary. As mighty as it is, DVD will be seen as merely a refinement of CD. You can take that prediction and bury it next to Sugar Creek. Just be sure to write down the GPS coordinates. And if you find a cookie canister, leave it alone. We've decided to wait for the Cubs.

S&V

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New Acoustimass® module.

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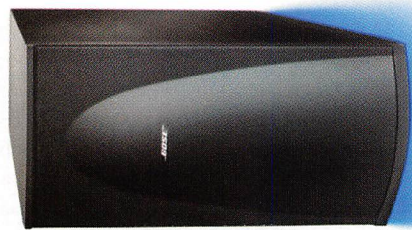
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Mobile Showstoppers



For a car stereo fanatic like myself, going to the annual Consumer Electronics Show in Las Vegas every January is like sending a kid to the toy store without a spending limit. Problem is, I can't fit all of the things I

want to bring back with me in my carry-on bag. At any rate, as editor in chief of *Car Stereo Review's Mobile Entertainment*, I get to see a lot of cool mobile toys at CES. Here's a sampling of some of the happen-



Keg party: If you're into taking 250 hours or so of downloaded music on the road with you, then Kenwood's Excelon Music Keg (\$900) is worth toasting. With 10 gigabytes of memory and PhatNoise Music Manager software on tap, the Keg can store MP3, WMA (Windows Media Audio), and WAV digital music files. It's shown here with the supplied USB docking cradle, which connects to your PC, and a removable hard-disk cartridge.



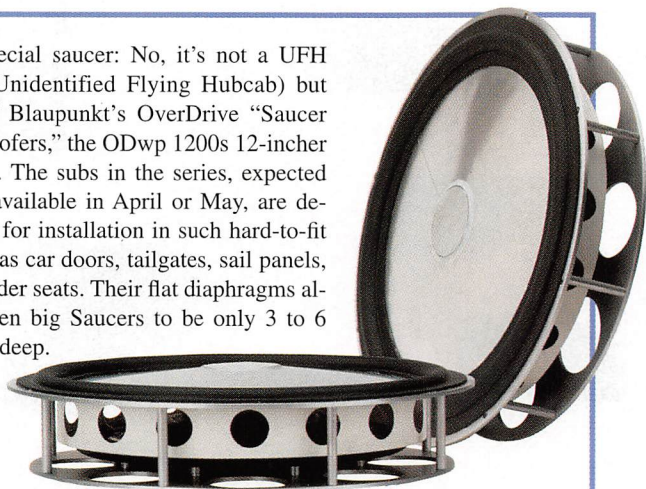
RACC 'em up: Alpine's V12 AccuClass-D line of digital mono amplifiers packs a digital signal processor with controls (under a flip-up panel) for adjusting subwoofer level, crossover point, and more.

Shown is the 900-watt MRD-M500 (\$550). The optional RUX-4280 Remote Amplifier Control Center, or RACC (\$100), lets you link up to eight mono V12 amps with synchronized settings via one display and name each amp individually—a handy feature when it comes to troubleshooting.



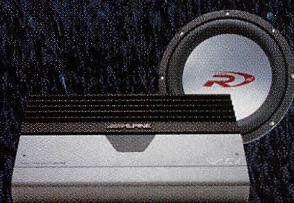
A dash of DVD: Clarion's VRX925VD in-dash DVD player (\$2,500) controls all the action rear-seat passengers could desire. It comes with a headrest-mounted, motorized 7-inch widescreen LCD monitor that provides touchscreen control. The built-in dual-zone switcher enables rear passengers to enjoy A/V programming separate from what's playing in the front of the vehicle. The head unit can be upgraded to receive Sirius satellite radio signals with the addition of Clarion's DSH920S tuner (\$200) and SA100 antenna (\$100). It can also control Clarion's VCZ625 six-disc DVD changer (\$1,200) and DVH920 Dolby Digital/DTS/Pro Logic II surround sound processor (\$550).

Special saucer: No, it's not a UFH (Unidentified Flying Hubcab) but one of Blaupunkt's OverDrive "Saucer Subwoofers," the ODwp 1200s 12-inch (\$250). The subs in the series, expected to be available in April or May, are designed for installation in such hard-to-fit places as car doors, tailgates, sail panels, and under seats. Their flat diaphragms allow even big Saucers to be only 3 to 6 inches deep.





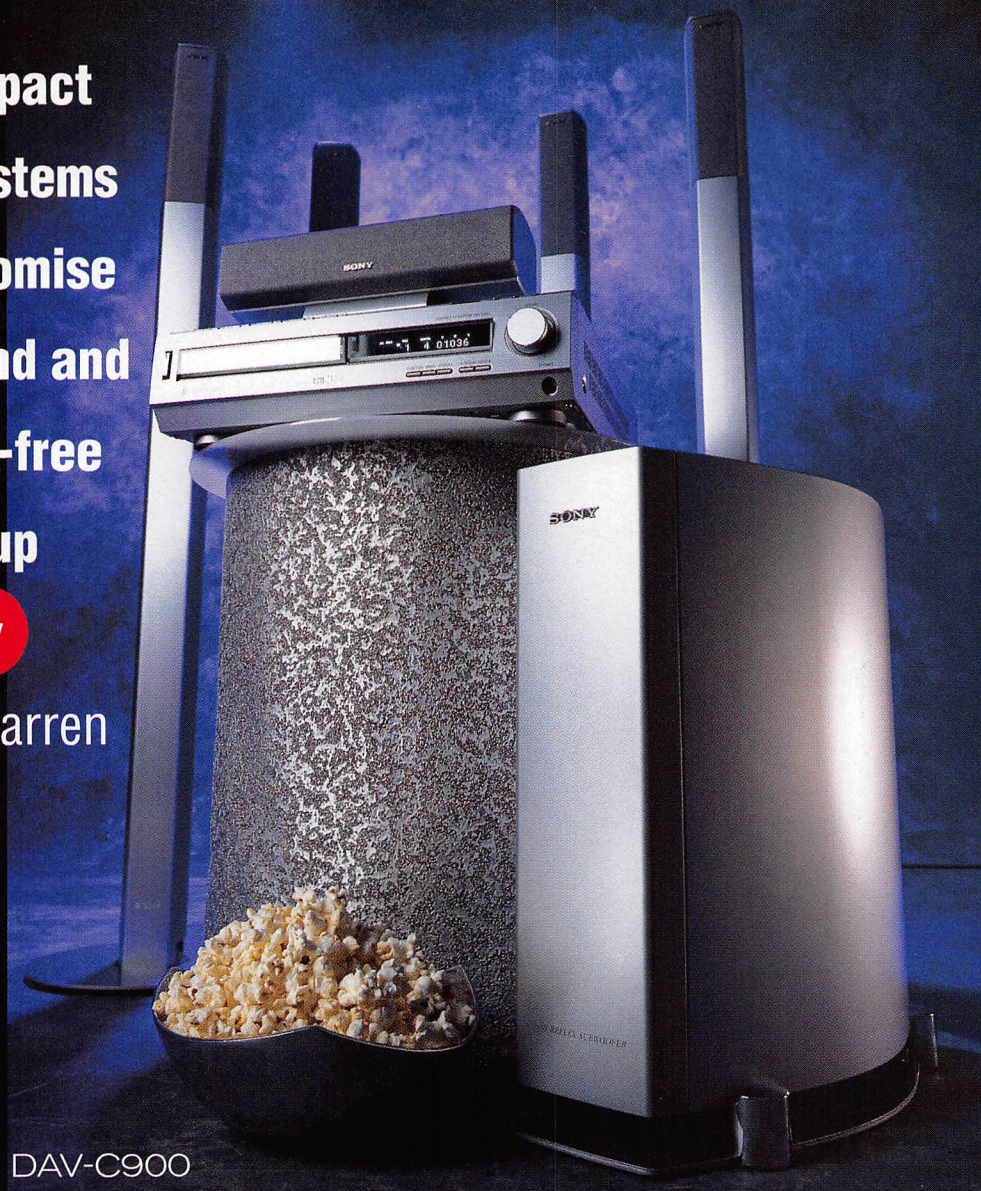
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SONY DAV-C900



KENWOOD/BOSTON ACOUSTICS UNITY

Although most enthusiasts shy away from “home theater in a box” systems because of their limited flexibility and modest power specs, there’s no denying their popularity. People love the idea of being able to buy a simple speakers-plus-electronics package that provides everything they need to enjoy movies and music in

out if any of today’s compact, self-contained systems could provide the intensity and excitement I’ve come to expect. Skipping over “starter” systems that sell for a few hundred bucks, I instead rounded up moderate-price packages from Kenwood/Boston Acoustics, Onkyo, and Sony. The Kenwood/Boston and Sony systems list for \$1,000, while the On-

kyo systems could come to turning my cozy family room into a capacious theater. The disc includes footage missing from the original theatrical release in a remastered video transfer supervised by Coppola. It challenges a home theater system the way the Vietnam War challenged the film’s protagonist, Captain Willard. Intense colors and fast action tested the mettle of the DVD players, while the equally spectacular soundtrack exercised the speakers with a broad palette of sounds ranging from choppers, bombs, and machine guns to Morrison, Jagger, and Wagner.

Before we get into my impressions of how well these systems performed, it’s important to point out that all three of them offer features I wouldn’t have expected given their size and price. For example, all provide component-video outputs, which will give you noticeably better DVD images than with S-video connections on large TVs equipped with matching inputs. All include digital audio inputs and outputs for adding such components as a CD recorder, digital satellite receiver, or cable box. And all perform full Dolby Digital and DTS decoding as well as providing several ambience modes that spruce up stereo program material for multichannel playback. The only thing missing from the

boxes each of these systems came in was a TV and a set of component-video cables.

Sony DAV-C900

Part of Sony’s popular Dream System series, the DAV-C900 compact A/V rig is exceedingly stylish, and it offers impressive value for the price. The company seems to have made the right compromises to put this package together for \$1,000. The en-



ONKYO HTS-L5

surround sound. Hook the system up to your TV, and you’re ready to roll. In fact, some one-box systems are so easy to set up that even dyed-in-the-wool A/V geeks use them as secondary systems in small rooms and recommend them to nongeek friends who want hassle-free home theater.

Having recently moved to a smaller house — and given up a state-of-the-art THX home theater in the process — I was interested in finding

kyo rig goes for \$1,300. I hooked up each system to my 42-inch wide-screen high-definition TV (HDTV) and gave it a thorough workout using both music and movie DVDs as well as plain old stereo CDs. After all, a good surround setup should be able to hold its own with music, too.

Starting with movies, I chose the DVD of Francis Ford Coppola’s *Apocalypse Now Redux* (Paramount Home Video) to see how close these

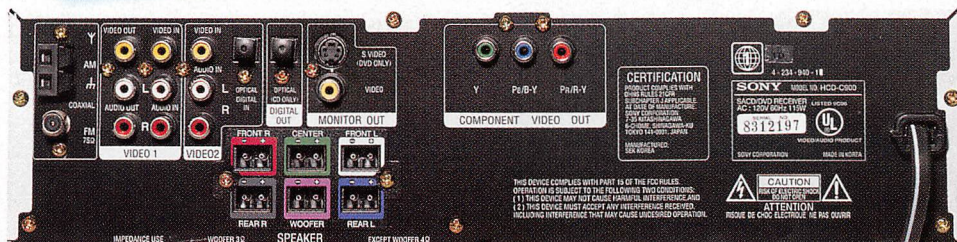
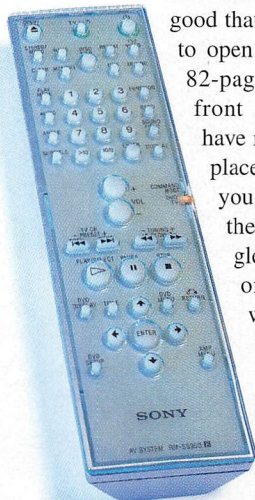
tire design, from assembly and appearance to operation, holds out the promise of a completely satisfying home-entertainment experience.

The left/right front and surround speakers, shaped like truncated ovals, are about as tall as a DVD case but less than half as wide and deep. The center speaker is about a third larger and every bit as stylish. Each has a 5/8-inch dome tweeter, dual 2-inch dome midrange drivers, and a ported enclosure. Looking like a pumped-up version of one of the satellites, the subwoofer is a nonpowered model with an 8-inch driver that fires downward and radiates through a slot all around the bottom of the cabinet. The three front speakers fire forward, and you can adjust the angle of the horizontally oriented center speaker within its shelf/set-top stand to aim it at your prime listening position. The surrounds, totally wrapped in sheer dark-gray grille cloth, have side-mounted drivers that fire toward the listening position.

All the other speaker cabinets have a brushed-aluminum finish to match the DVD player/receiver — a remarkably compact electronics package rated to deliver 70 watts to each of the satellite speakers and 100 watts to the sub. A five-disc elevator-style changer mechanism lets you swap out four DVD, CD, or Super Audio CD (SACD) discs while a fifth disc plays.

The system literally goes together in a snap. All you have to do is follow the full-color setup poster — which is so good that you might not even have to open the competently written, 82-page manual. The left/right front and surround satellites have rubber feet so they can be placed on shelves or tables, but you'll probably want to snap them into the supplied single-piece floor stands shown on page 42, which have wide, nontipping circular bases and measure 41½ inches tall with speakers attached.

I connected the supplied speaker wire to the bottom of each stand,



fast facts

KENWOOD/BOSTON UNITY

- **Dimensions (WxHxD)** main unit, 18 x 3¼ x 16½ inches; subwoofer, 14 x 13¾ x 13¾ inches
- **System weight** 45½ pounds
- **Price** \$1,000
- **Manufacturer** Kenwood USA, 2201 Domingues St., Long Beach, CA 90810; www.kenwoodusa.com; 800-536-9663

ONKYO HTS-L5

- **Dimensions (WxHxD)** TX-L5 receiver, 17½ x 3¼ x 14¾ inches; DV-L5 DVD player, 17½ x 2¼ x 14 inches; front L/R speaker, 7½ x 35 x 10½ inches; subwoofer, 9¼ x 19¾ x 16½ inches
- **System weight** 90 pounds
- **Price** \$1,300
- **Manufacturer** Onkyo USA, 18 Park Way, Upper Saddle River, NJ 07458; www.onkyousa.com; 201-785-2600

SONY DAV-C900

- **Dimensions (WxHxD)** main unit, 14 x 2¾ x 14¾ inches; subwoofer, 9½ x 17½ x 16¼ inches
- **System weight** 59½ pounds
- **Price** \$1,000
- **Manufacturer** Sony, One Sony Dr., Park Ridge, NJ 07656; www.sonystyle.com; 800-222-7669

which routes the signal to the speaker atop it via internal, integral conductors — no need to snake wire through the stands or to let it droop from the backs of the speakers down to the floor. The speaker wire is terminated in plastic connectors that snap into jacks on the receiver's rear panel. At the speaker end, bare wires mate with spring-loaded terminals. All the connections are color-coded, so it would really take an effort to hook things up wrong.

Besides the simple, neat connections, there's another bonus if you use the stands: more bass from the base. The port on the bottom of each L/R satellite mates with a port in the stand for a slightly fuller sound. (The setup menu includes separate equalization settings for using the satellites with and without the stands.)

The DVD receiver exhibits the same tastefully modern styling and user-friendliness as the speakers. The beveled top edge contains all the disc-player controls, while half of the front panel is the disc-loading drawer. Most of the rest showcases the fluorescent display, with only a handful of

controls below it for sound field, radio band, and function. At right are the large volume knob and headphone jack.

Although the fluorescent display is readable enough, the onscreen displays that the receiver/player generates on your TV are more stylish. The remote control is unusually attractive, with styling that matches the receiver and glow-in-the-dark keys. It's also preprogrammed to control most TVs. While the remote's printed legends are small and a bit hard to read, the handset is still fairly easy to use thanks to its logical layout and use of different key sizes.

It was a straightforward process to set up the Sony DAV-C900 system and adjust its speaker levels and time delays. The receiver has only a single optical digital audio input and output (no coaxial), only a single VCR input, and no provision for any other analog component.

When I took the system to the apocalyptic war, it survived with honor. The modest subwoofer delivers more than a pretty face. The *whoomp* of the chopper blades and the *boom* of the bombs shook the house to such a degree that I expected a visit from my new neighbors. The guns sharply reported. Every obscenity came through loud and clear, as did the whispered dialogue. My only mild disappointment was a lack of musical warmth and depth in *The Ride of the Valkyries* accompanying the helicopter-attack scene. I remember a more all-encompassing musical wash in the theater. Legendary Doors frontman Jim Morrison, however, sounded his normal agonized self, with the system reproducing the full fabric of his deep, rugged voice.

The DAV-C900 was equally adept at peace. The Telarc CD of the Brahms Second Piano Concerto, with Horacio Gutierrez as soloist and André Previn conducting, sounded full, authoritative, and balanced. To check the pop side of the spectrum, I played a CD released not too long after the original version of *Apocalypse Now*, Dire Straits's *Making Movies*. Mark Knopfler and the gang sounded just right, with full instrumentals, an appropriately twangy Fender guitar, and clean vocals. I pushed the Sony Dream System's limits and found that its maximum volume was limited, as I would expect. But like the other systems in this group, the DAV-C900 is meant for small to moderate-size rooms. Sony succeeded in designing a system that can surround you with full 5.1-channel sound while taking up little more space than a conventional two-channel system. It goes a long way to counter typical objections to home theater.



Kenwood/Boston Acoustics Unity

Kenwood teamed up with the highly regarded speaker maker Boston Acoustics to create the Unity system. It seems an intelligent move for Kenwood — leave the speakers to the experts. The oddly shaped, gray plastic satellite speakers, with 3-inch midrange drivers and 3/4-inch tweeters, look something like multimedia computer speakers. The center speaker is about the size of a small loaf of bread, the left/right front and surround satellites slightly smaller. The subtly trapezoidal subwoofer, which packs an 8-inch driver and a 100-watt amp, is roughly the size of a 12-inch cube. The full-size Kenwood receiver, which incorporates a single-disc DVD/CD player, supplies 30 watts to each of the satellites.

The Unity resembles the Sony system in some ways. It also comes with a full-color setup poster and an informative 58-page manual. And it's about as easy to set up, using color-coded wires with connectors that snap into the player/receiver and color-coded ends that fit into snap connectors on the speakers. The subwoofer connects via a special three-conductor cable and must be plugged into its own AC outlet.

The left/right satellites lack stands but have keyholes for wall mounting.

Kenwood's DVD player can handle both recordable CD-Rs and rewritable CD-RWs containing MP3 files. The minimal controls blend into a front-panel trim stripe, keeping the design sleek and sexy. Multicolor LEDs on the lower half of the panel indicate the decoding/processing system in use, except there is none for stereo mode. An unusually bright red LED shines down on and reflects off the large, rectangular power button on the lower left side. A fluorescent dot-matrix display fills the center, while a large, very shiny silver volume knob sits just to its right. A spare set of inputs along with radio tuning controls hide behind a fold-down door on the lower right.

The remote control is about the same size as the Sony system's, but it has slightly larger keys in a much greater variety of shapes and colors, so it's easier to use. The remote can control a TV, a VCR, a satellite



receiver, and a cable box in addition to the player/receiver. While it has more buttons than are really needed for normal operation, it's intelligently designed. My main gripe is that the button for switching between stereo and surround modes is too small and poorly marked. And the selected audio mode is indicated only on the front-panel display, not in the onscreen display, which clearly shows you everything else you need to know.

The Unity setup procedure lets you adjust individual channel levels with the built-in test tones, but it doesn't have time-delay adjustments to compensate for the varying speaker distances. However, unlike the Sony, it includes Dolby Pro Logic II (DPL II) processing, which can create a credible 5.1-channel listening experience from two-channel stereo or matrixed Dolby Surround program material.

When I returned to the jungle in *Apocalypse Now Redux*, the Unity system brought the horrors of the Vietnam War home in all their morbid glory. It also added a slight high-end emphasis, bringing out the turbine whine of the choppers, which hadn't been as noticeable in playback over the Sony system. The Unity subwoofer's output was impressive — so much so that my couch shook whenever a bomb exploded. Watch out for your fine china and crystal.

Even amid all the battlefield mayhem, the dialogue came across clearly. And when the boat crew hears the Rolling Stones' "(I Can't Get No) Satisfaction" over their portable radio and the soundtrack briefly expands the music to full fidelity instead of transistor tinniness, I was wowed by the Unity system's wide dynamics and accurate reproduction.

Played over just the front L/R speakers and the subwoofer, stereo music lacked the edginess I heard on movie soundtracks. Dire Straits thundered from the speakers with satisfying, adrenaline-producing sonics — especially with DPL II processing engaged — and the Brahms concerto sounded rich and full. Overall, the Unity system supplied plenty of sonic satisfaction.

Onkyo HTS-L5

In contrast to the Sony and Kenwood/Boston entries, Onkyo's HTS-L5 looks much more like a conventional component system. And in one sense, it is, since the electronics consist of the full-size TX-L5 digital surround receiver, which is rated to de-

key features

	KENWOOD/ BOSTON UNITY	ONKYO HTS-L5	SONY DAV-C900
Surround decoding (Dolby Digital/DTS/DPL II)	yes/yes/yes	yes/yes/yes	yes/yes/no
Plays SACDs	no	no	yes
Plays CD-R/CD-RW discs	yes	yes	yes
Plays CDs with MP3 files	yes	yes	no
Subwoofer	8-inch cone; 100 watts	8-inch cone; 60 watts	8-inch cone; 100 watts
Video switching (composite/S-video/component)	3/2/1	player, 1/1/1; receiver, 3/3/0	2/1/1
Analog inputs (audio/video)	0/3	1/4	0/2
Digital audio inputs (coaxial/optical)	2/2	1/2	0/1
Digital audio outputs (coaxial/optical)	0/2	1/1 (player only)	0/1
Headphone jack	yes	yes	yes
Universal remote	yes	no*	yes (TV only)

* Two remotes supplied; receiver remote will also control an Onkyo MiniDisc recorder.



DVD goes to war: The intense colors, fast action, and spectacular soundtrack on *Apocalypse Now Redux* challenged the performance of these DVD minisystems.

liver 22 watts apiece (into 6 ohms) to five channels, and the DV-L5 DVD player (they're also available separately). Onkyo even supplies separate manuals for each component and the speakers as well as separate remote controls for the receiver and DVD player — you'll need both for setup, but either will control both components.

With champagne metal faceplates highlighted by amber displays, these components stand out from the silver-and-blue crowd. So do the satellite speakers, which have a handsome woodgrain vinyl finish and are much larger than those in the other two systems. The front L/R speakers are actually mini-towers, and at nearly 20 inches tall, the black finished subwoofer is substantial. Each of the front speakers has two 3½-inch mid-range drivers and a 1-inch tweeter; the surrounds have one of each. The sub has an 8-inch driver and a built-in 60-watt amplifier, and it's the only one of the three subs with its own level and cross-over frequency controls — they're mounted on the front panel along with the port.

Setting up the Onkyo system required about the same effort as

would be required for any system of conventional components. No color setup poster. The supplied, bare-ended wire connects to binding posts on all the satellite speakers. The receiver has binding posts for the front L/R outputs and spring-loaded terminals for the other channels. The onscreen setup menu lets you balance levels for each speaker, but time delay must be set in pairs for the L/R front and surround speakers.

A shielded RCA cable is provided to connect the subwoofer to the receiver. One unfortunate inconvenience: while the DVD player has component-video outputs, the receiver has no component-video switching. So to view the receiver's onscreen displays, you'll have to also run a separate cable to a composite- or S-video input on the TV. Both Onkyo remotes leave much to be desired, with barely differentiated

keys — all small, either gray or black and round or oval shaped — and a cursor pad in the center. At least the receiver remote has two large volume up/down bars on the bottom.

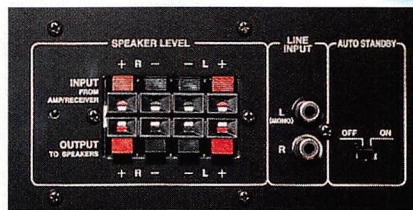
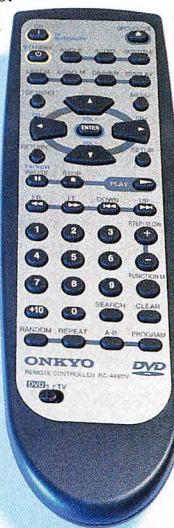
The Onkyo components include a nearly full array of analog and digital inputs and outputs. The receiver lacks only a digital audio output, although the DVD player has one in both optical and coaxial flavors. A front-panel stereo button, duplicated on the remote, lets you jump directly between a surround mode and stereo — you don't have to cycle through the array of surround settings. Like the Kenwood/Boston Unity, the Onkyo receiver includes Dolby Pro Logic II decoding/processing.

In every respect, the Onkyo system delivered, from the grand to the subtle. Jungle noises, the patter of rain, metal against metal, and the crinkle of paper — all sounded real. The machine-gun fire and bombs burst with chest-punching power.

Voices sounded natural, with a nice depth. The segment of the movie featuring *The Ride of the Valkyries* rekindled my memories of hearing it in the movie theater. Music fared equally well, with satisfying depth and natural color. The bass sounded tighter than on the other two systems. These components and speakers could be the primary music system in a small to medium-size room.

You'll pay more for the Onkyo HTS-L5 system, and setting it up will take longer. In contrast, even a novice could set up either the Sony or Kenwood/Boston system in less than an hour, and using either of them is more straightforward, too. But what you'd give up in exchange would be the Onkyo system's better sound quality. It's your call which is worth more to you.

Only a couple of years ago, it seemed as if you'd need a job with a rising dot-com to assemble a great-sounding DVD-based home theater system. These three systems show that captivating home theater has gotten more affordable. Admittedly, none of them has the huge dynamic range and ultra-low distortion of more expensive separates, nor all the flexibility and customizability that A/V perfectionists demand. But depending on your situation, any one of these three could enable you to transform a modest space into a convincing home theater at reasonable cost.



KENWOOD/ BOSTON UNITY

ONKYO HTS-L5

SONY DAV-C900

DVD-VIDEO PERFORMANCE

(test patterns from various test DVDs using each player's composite-video outputs)

Setup level	+7.5 IRE	+7.5 IRE	+7.5 IRE
100%-white-level error	+1 IRE	+2 IRE	+1 IRE
Differential phase	1°	1°	1°
Differential gain	+1 IRE	+1 IRE	+1 IRE
Horizontal luminance frequency response (re 1 MHz)			
at 4 MHz	-0.45 dB	-0.18 dB	0 dB
at 5 MHz	-0.92 dB	-0.63 dB	-0.18 dB
at 6 MHz	-1.7 dB	-2.3 dB	+0.42 dB
at 6.75 MHz (DVD limit)	-1.7 dB	-3.1 dB	+1.9 dB
Equivalent onscreen resolution	540 lines	540 lines	540 lines
In-player letterboxing	poor	fair	good

SPEAKER/SYSTEM AUDIO PERFORMANCE

Frequency response (at 2 meters)			
front left/right	240 Hz to 19.5 kHz ±5.1 dB	400 Hz to 15.7 kHz ±4.0 dB	320 Hz to 13.8 kHz ±4.8 dB
center	360 Hz to 20 kHz ±3.8 dB	175 Hz to 15.8 kHz ±3.7 dB	230 Hz to 13.1 kHz ±4.4 dB
surround	280 Hz to 18.4 kHz ±3.9 dB	260 Hz to 11.2 kHz ±3.7 dB	240 Hz to 3 kHz ±5.7 dB
subwoofer	30 Hz to 151 Hz ±12 dB	51 Hz to 118 Hz ±2.2 dB	54 Hz to 85 Hz ±2.2 dB
Bass limits (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)			
front left/right	100 Hz at 67 dB SPL	80 Hz at 72 dB SPL	100 Hz at 68 dB SPL
center	100 Hz at 67 dB SPL	80 Hz at 80 dB SPL	125 Hz at 66 dB SPL
surround	100 Hz at 67 dB SPL	80 Hz at 75 dB SPL	100 Hz at 68 dB SPL
subwoofer	25 Hz at 85 dB SPL	40 Hz at 85 dB SPL	40 Hz at 85 dB SPL
(average SPL from 25 to 62 Hz)	97 dB	99 dB	96 dB
(maximum SPL at 62 Hz)	102.3 dB	109.4 dB	103.1 dB

The DVD players in these three systems, measured through the composite-video outputs, had approximately equivalent performance. The only significant difference, in fact, was in the in-player letterboxing, a characteristic that is relevant if you watch widescreen DVDs on a standard 4:3 aspect ratio TV instead of a widescreen 16:9 set. The Sony player's unusually boosted luminance frequency response was barely visible on test patterns and not at all with movies, which rarely have significant details this small.

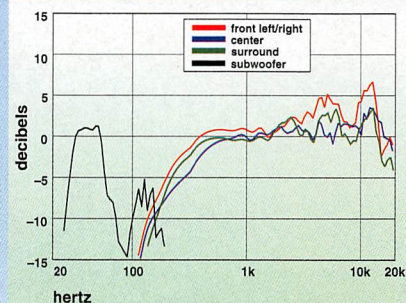
All of the curves in the speaker frequency-response graphs are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. Where the same satellite speaker is used in different positions, the differences in the curves reflect the varying listening windows and the weighting. The tower-style front left/right speaker in the Onkyo system was measured placed on the floor, and the front L/R speaker in the Sony system was measured placed on its supplied stand. Since each system contains its own electronics, speaker sensitivity and impedance have no meaning so weren't measured. In each case, bass limits for the subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL).

The bass response of all the satellite speakers

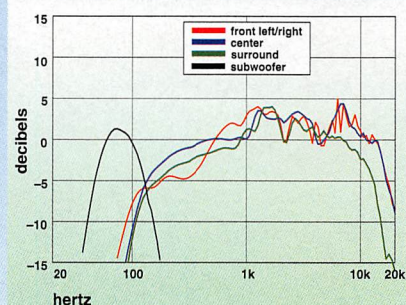
in the Kenwood/Boston Acoustics Unity system was limited. The L/R front and surround showed a "haystack" elevation between 2 and 8 kHz as well as a 12-kHz treble peak. The surround curve appears smoother because the treble was more attenuated at very wide angles. The center speaker's response was much smoother, especially out to 22.5°, although the general shape bears a familial resemblance to those of its brothers. The Unity subwoofer had excellent low-frequency extension and output for such a small enclosure, but there was a hole in its response at 80 Hz.

The bass output of the front L/R speaker in the Onkyo HTS-L5 system fell rapidly below 400 Hz. The speaker's fairly irregular response was different at all radiating angles, and our averaged graph curve appears smoother than it actually measured. The center speaker also had response that varied with the listening angle. In this case a hump from 1 to 7 kHz on-axis was actually smoothed out at 22.5° on its way to becoming a deep notch at 45° off-axis. On the other hand, the system's surround speaker measured quite uniformly at every listening angle — the bump from 1 to 3 kHz appears in all traces. The Onkyo subwoofer had tremendous output at 62 Hz but rolled off quickly below that. The crossover frequency control had a limited range, with actual turnovers of 118 Hz at a marked 200 Hz, 100 Hz at a 12-noon setting, and 90 Hz at a marked 50 Hz.

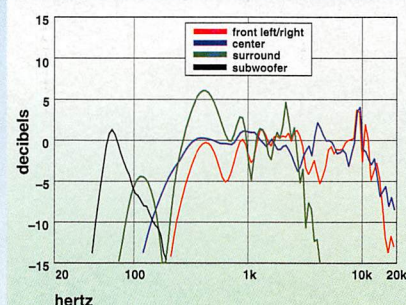
Kenwood/Boston Unity



Onkyo HTS-L5



Sony DAV-C900



There was about 8 dB of volume change as the control was moved over its full rotation, meaning you'll have to rebalance the level whenever the crossover control is adjusted.

The Sony DAV-C900 system's front, center and surround satellites all displayed a fairly rough overall response, with limited bass extension and dynamic capability plus a sharp peak at 9 kHz (most likely a tweeter resonance). The center speaker had the smoothest on-axis response, but the unevenness common to horizontally arrayed speakers began at 15° off-axis and got worse at wider angles. The surround speaker appeared to be band-limited at high frequencies, which is not unusual for surrounds. The subwoofer's output peaked at 65 Hz, and it appeared to be high-pass-filtered at more than 36 dB per octave below that frequency and rolled off at 6 dB per octave above it.

— David Ranada and Tom Nounsaine

20th Century Fox

4 Media Company (4MC)

The Bakery

Casablanca Film & Video

Chace Productions

Chicago Audio Works

Cinram/POP
DVD Center

Complete Post

Digimix

Digital Sound
and Vision

DTS

Dolby Labs
NY, LA, SF

DreamWorks SKG

Electric Switch

Enterprise DVD
and Post

FotoKem Film
and Video

Gateway Mastering

HBO Productions

HD Vision

Hit Factory

JAK Productions

Laser Pacific

Lucasfilm LTD

Monterey Post

Motorola DSP

NARAS

Paramount Studios

Saban Entertainment

Seventeen Grand

Skywalker Sound

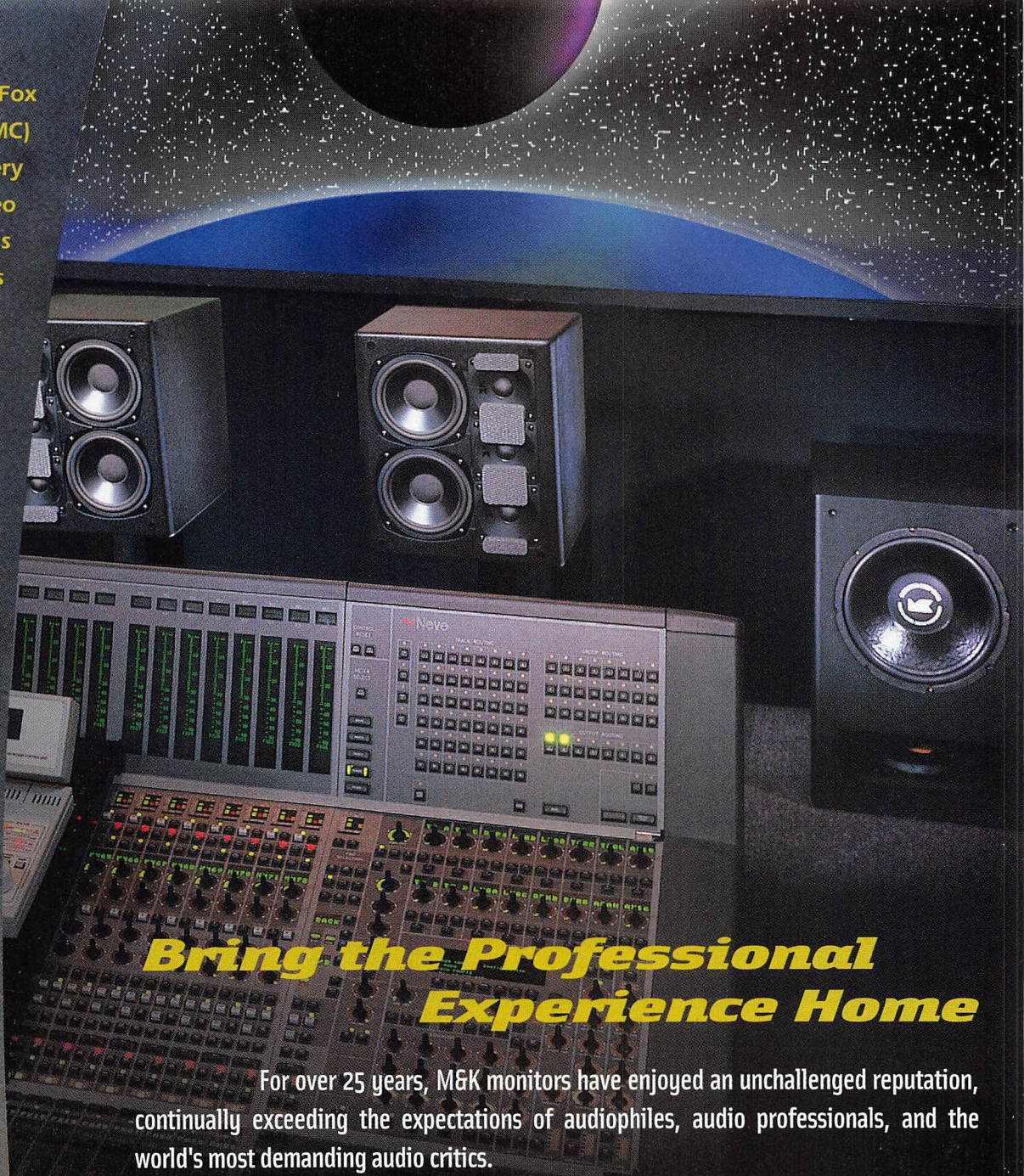
Sony Music

Sony Pictures

Universal Studios

Walt Disney Studios

Warner Brothers Studios



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55-inch HDTV Monitor



the screen by zooming in on 4:3 programs, while Smart Stretch accomplishes the same task by stretching the image mildly at the center and more aggressively at the edges. Finally, the Stretch mode is for viewing widescreen anamorphic DVDs and HDTV programs.

In terms of styling, not much distinguishes the 55R-WP5H from its peers in the RPTV world. It's big and black, it comes with a protective screen shield, and a flip-up door on the front panel conceals a set of controls as well as an A/V input for hooking up a camcorder or game console.

Although the remote control is packed with buttons, most of the keypad is backlit, allowing you to easily select channels, change volume, or navigate menus in the dark. You can program the remote to operate a set-top HDTV tuner, a cable box, a DVD player, and a VCR, and there's even a decimal key for selecting a digital broadcaster's subchannels (for example, Channels 24.1, 24.2, or 24.3).

The two sets of wideband component-video inputs on the rear panel let you hook up both an outboard HDTV tuner and a progressive-scan DVD player. A VGA input is included for the handful of HDTV tuners using that type of output. The set's

fast facts

KEY FEATURES

- Widescreen TV with multiple aspect ratios
- Upconverts standard-definition signals with 2:3 pulldown
- User-selectable scan-velocity modulation
- Custom picture memory for each input

INPUTS/OUTPUTS

front composite/S-video, stereo audio inputs
rear two wideband component-video, one VGA, two S-video, and three composite-video inputs, all with stereo audio; two RF antenna inputs, one output; center-channel audio input; composite-video and fixed/variable-level stereo audio outputs

DIMENSIONS (WxHxD) 51¼ x 50 x 28⅓ inches

WEIGHT 257 pounds

PRICE \$3,499

MANUFACTURER Sharp Electronics, Dept. S&V, Sharp Plaza, Mahwah, NJ 07430; www.sharp-usa.com; 800-237-4277

Sharp Electronics has had a long association with LCD technology, and when high-definition TV first got off the ground, it rolled out a 60-inch rear-projection HDTV using its three-panel CGS (continuous grain silicon) twist on LCD at trade shows. Like other LCD rear-projection TVs (RPTVs) announced at the time, the Sharp was never released (more tinkering is required before LCD RPTVs make it to stores), but the company has filled the gap with widescreen RPTVs that rely on traditional cathode-ray tube (CRT) technology. Given Sharp's intense focus on LCD, I half-expected these sets to be perfunctory, but the 55-inch (diagonal) 55R-WP5H turned out to be a pleasant surprise.

The widescreen set is packed with every cutting-edge feature you'd find on similar RPTVs from other manufacturers, and at \$3,499 it's also competitively priced. It displays 1080i-format high-def broadcasts in their native resolution, and for programs in the 480i (interlaced) and 480p (progressive) standard-definition formats, you can select upconversion to either 540p or 1080i, with the additional option of 2:3 pulldown processing for material that originated on film.

You can toggle through four display modes by repeatedly pressing the View Mode button on the remote control. The Side Bar mode is for viewing geometrically correct 4:3 aspect ratio images flanked by gray side panels. The Cinema mode fills

test report

HIGH POINTS

Flexible input and picture-memory options.
Superb rendering of high-definition programs.
Backlit remote control.

LOW POINTS

Color decoder slightly accentuates red.
Black level varies with overall picture brightness.

flexible Twin Picture function can display both high-def and standard video sources onscreen at the same, either in two equal-size windows or one large window with a smaller picture beside it.

As with other CRT-based RPTVs, setting up the 55R-WP5H should begin with a careful convergence of its three tubes. I was glad to see that the set's convergence was good straight out of the box, and it took only a few minutes of tweaking with its nine-point adjustment grid to get the images looking extremely crisp. In addition to standard picture controls (contrast, brightness, color, tint, and sharpness), the TV features a variable scan-velocity modulation (SVM) setting and a black-level control to expand its brightness range. There's also a gamma control with Soft, Mid, and Hard settings that you can use to pull out additional shadow detail in dark DVDs, although I generally preferred to leave this switched off.

Along with its SVM and gamma controls, the Sharp offers a high level of flexibility for storing picture settings. Picture adjustments that you make in the User mode are automatically stored, and you can save custom settings for each of its in-

puts. Modifications made to its four preset picture modes also get saved in memory. To quickly access a picture mode, you press the A/V Mode button on the remote, then toggle through the selections by pushing the button again.

After making my initial picture adjustments, I selected the Low color-temperature setting and tossed the new DVD release of *Air Force One* into my player's disc tray. My first impression was that the Sharp's picture was very good. However, in a nighttime scene where Russian hijackers posing as reporters gain entrance to the presidential jet, the set's contrast range appeared slightly compressed, causing shadow details to be buried in the black background. Tweaking the gamma helped somewhat, but the Overscan Bounce test on the *Avia* setup DVD also indicated that the set's ability to hold a constant level of black was somewhat below average.

Overall, the Sharp produced a very detailed and noise-free picture, and when I shut SVM off — it's very unusual to be able to do this in a TV's setup menu — the image was free of the harsh, "ringing" edges SVM circuits often produce. Colors, too, looked vibrant and clean. But when I viewed an interior shot in *Air Force One* where the president (Harrison Ford) is relaxing with his family, I couldn't help but notice that their skin tones lacked normal variation, looking uniformly pink-orange. After I tweaked the set's color temperature and turned the color setting down to compensate for a slight inaccuracy in its color decoder (see "in the lab"), the first family's faces looked more natural, though colors were a bit less vibrant than before.

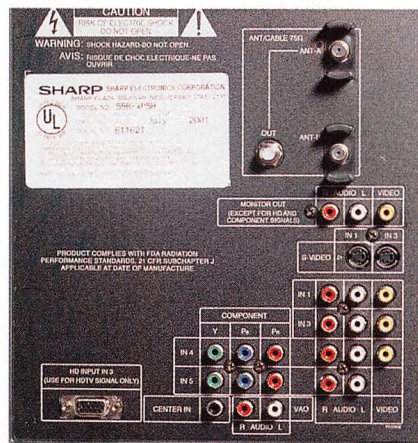
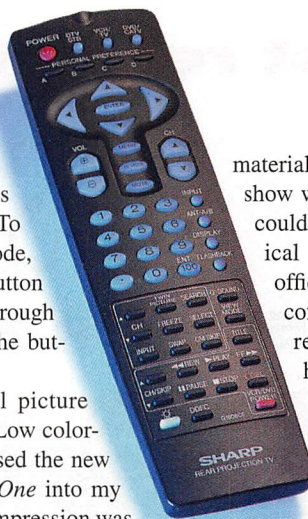
The set's built-in upconverter delivered clean and detailed images in both the 540p and 1080i display formats. There are actually two 1080i settings: Interlace and Auto. Sharp's manual erroneously says that only the 1080i Interlace mode enables 2:3 pull-down processing for artifact-free upconversion of programs that were originally shot on film — I found the opposite to be true. With the 1080i Auto mode selected in the opening shot of *Dragonheart*, Chapter 8, the many fine diagonal lines looked solid and clear.

I hate to confess to watching soap operas, but CBS's daily high-def broadcasts of *The Young and the Restless* look so good that they've joined my arsenal of reference

material. The Sharp's handling of the show was nothing short of superb. I could easily read text in an anatomical chart hanging on a doctor's office wall, and in a scene in a coffee shop, I could tell that the restaurant logo on the menu held by one of the characters matched the logo on a coffee mug held by an extra in the background (good prop work!).

For a company that's had its high-end product line linked with LCD for years, Sharp has delivered a fine CRT-based rear-projection HDTV. I found something to admire in almost every aspect of the 55R-WP5H: an easily navigated menu system, abundant setup options and video connections, and a well-defined picture. LCD technology may soon join Digital Light Processing (DLP) and plasma in trimming away the CRT's dominant position in the TV world, but until that day comes, sets like this one from Sharp will do just fine.

S&V



in the lab

COLOR TEMPERATURE (Low setting before/after calibration)

Low windowNA/6,529 K
High window8,180/6,438 K

BRIGHTNESS

(before/after calibration)47.2 /31.9 fL

With its Low color-temperature preset selected, the Sharp 55R-WP5H measured reasonably close to the NTSC color standard on the high-window test pattern from Ovation Software's *Avia* DVD, but the low-window pattern leaned toward the purple range and was off the measurement scale. After calibration, the TV measured approximately 6,500 K at both ends of the grayscale, tracking within 200 to 500 K at each 10-IRE increment, which is average. (Calibration needs to be performed by a qualified technician with specialized equipment, so discuss it with your dealer before purchase, or call the Imaging Science Foundation at 561-997-9073.)

Resolution with DVD test patterns measured the maximum 540 lines for the format. The TV's ability to hold black was slightly below average. The color decoder accentuated reds (+10%), so a reduction in saturation was necessary to achieve realistic colors. Picture geometry, focus, and screen convergence were all excellent right out of the box, while overscan was a better-than-average 3% on all sides. The set's excellent 3-D digital comb filter helped to minimize rainbow artifacts when a composite-video connection was used.

— A.G.

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Funny, with all the synthetic effects and gimmicks available on today's home theater systems - no one is talking about what really counts - delivering the best sound for the dollar. The NAD T752 A/V Receiver and T571 DVD/CD Changer's unique designs provide everything you need to enjoy a great movie or music. And, as with all NAD products, they maintain a reputation for true value, performance and simplicity.

NAD - to the rescue.

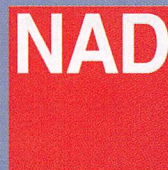
NAD T571 DVD/CD Changer

5 disc capacity, plays DVD-Video, CD, CD-R, CD-RW, MP-3, 4x10 bit 54 MHz Video DACs, Audiophile quality 24 bit/96 kHz Audio DACs, Component, S-Video and Composite Video outputs, Progressive Scan with 3:2 Pull Down, Coaxial and Optical digital outputs, 3 CD Random Access modes, MP-3 and HDCD decoders integrated, 12V trigger input, and remote control.

NAD T752 Surround Sound Receiver

80 watts continuous power into 8 ohms (all 5 channels driven simultaneously) with PowerDriveAudio/Video™ topology, Dolby Digital, Dolby Digital EX, DTS ES, DTS NEO:6, 7.1 Matrix, ProLogic II, EARS and Stereo Enhanced Surround Modes, preouts for all channels (2 subwoofers), 7.1 analog input from external decoder, 6 video inputs all S-Video and Composite, Component Video on 3 inputs and 1 output, 2 video outputs, 6 digital inputs, 2 digital outputs, 9 audio inputs, 1 tape output, Soft Clipping, 2 x 12V output triggers, 1 x 12V trigger input, Illuminated Universal Learning Remote

pure. and simple.



Mitsubishi

DD-8020 DVD-Audio/Video player



Sometimes technology scares me. Don't get me wrong: I'm a techno guy through and through, but the rapid pace at which technology is evolving sometimes makes me wonder if we won't eventually become enslaved by monster robots. Today's DVD players have an incredible number of features crammed into their silicon minds. How long until they start telling me which movies to watch, or what TV I should buy?

Case in point: Mitsubishi's DD-8020. My reference player is also a Mitsubishi, purchased only a few years ago. It does a terrific job, but the DD-8020 definitely ups the ante. Beneath its plain façade, this player has formidable capabilities. In addition to playing DVD-Video movie discs, it can also play the new surround sound DVD-Audio music discs, write-once DVD-Rs, and CDs, including CD-Rs containing MP3 files. (My review unit could not play CD-RWs with MP3 files, however.) It can decode Dolby Digital (DD) soundtracks, and DTS soundtracks are passed through for external decoding. Its component-video output can be set for either interlaced or progressive scan with selectable or automatic 2:3 pulldown processing for the best possible picture quality.

This player doesn't waste your time with gee-whiz features, but there are some inter-

esting extras you can access via the remote. For example, you can zoom the picture in or out, with a shiftable zoom point and 12 magnifying steps, or call up an on-screen virtual remote that's a lot easier to use in a dark room than the real handset since its keys aren't backlit.

A comprehensive but easy to use Navigation menu gives you access to still more features, like delay-time and bass-management settings for 5.1-channel playback. (Bass management is important because it lets you keep deep bass away from small satellite speakers that can't handle it, redirecting it instead to the subwoofer.) Unfortunately, like most of the DVD players now on store shelves, the bass management is effective only for Dolby Digital-encoded soundtracks, not for the multichannel analog output from DVD-Audio discs.

Wait! There's more! You can create a series of strobed freeze frames from any selected scene of a DVD movie and display thumbnail shots of the first frames of titles or chapters. More usefully, you can tweak picture brightness, color, contrast, tint, digital noise reduction, and edge enhancement and store the combinations of settings as three different presets.

The rear panel of the DD-8020 features the typical complement of audio and video outputs, with a slide switch to select either

interlaced or progressive-scan format. To check the player's internal Dolby Digital decoder, I connected its multichannel analog outputs to my Denon receiver and its component output (set to progressive scan) to my Princeton Graphics monitor.

I started by watching *The Fast and the Furious* (Universal), a by-the-numbers escapist flick about "rice rockets" (Asian-made cars souped up for drag racing), 10-second highs, undercover cops, and various chemical compounds including testosterone, estrogen, and nitrous oxide. The

fast facts

KEY FEATURES

- Plays DVD-Audio and DVD-Video discs
- Plays CDs and CD-Rs with MP3 files
- Plays CD-RWs with standard CD tracks
- Full decoding of Dolby Digital soundtracks
- 6-channel analog output
- Component-video output switchable between interlaced and progressive-scan

OUTPUTS composite-, component- and S-video; coaxial and optical digital audio; stereo and multichannel analog audio

DIMENSIONS 17 inches wide, 3 $\frac{3}{8}$ inches high, 12 $\frac{1}{8}$ inches deep

WEIGHT 6 $\frac{1}{2}$ pounds

PRICE \$379

MANUFACTURER Mitsubishi Digital Electronics America, Dept. S&V, 9351 Jeronimo Rd., Irvine, CA 92618; www.mitsubishi-tv.com; 800-332-2119

"A giant...near perfection."
 – Sound & Vision magazine on the
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See Bob Rock.

The new Sunfire *True Subwoofer* by Bob Carver has received reviews that are redefining the subwoofer industry.

*There has never been a subwoofer like it!
There will never be a subwoofer like it!**

*It's a small eleven inch square bass cube,
and it shakes the walls
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two thousand, seven
hundred watt amp!*

**Trust Bob.
It Rocks!**

SUB REVIEWS



"The True Subwoofer is an achievement on par with the space shuttle and the twinkie."

—Al Griffin

Home Theater, Feb, 97



"Talk about floor shaking bass...turned up to maximum level, I don't think there was anything in the house that wasn't shaking, including the concrete foundation!"

Don't, I repeat, don't even think about purchasing another subwoofer without giving the Astonishing True subwoofer a listen.

—Joseph M. Cierniak

The Sensible Sound, Issue # 60



"The lowest, flattest, deepest bass I have EVER heard or measured."

—Julian Hirsh

Stereo Review, Dec. 96

***Strictly speaking: for 20 years until patent expires.**

For additional information on Sunfire, call or write to Sunfire Corporation, P.O. Box 1589 Snohomish, WA 98290 (425)335-4748 • Tech Notes: Flat to 18 Hz. Powered by 2700 watts.



www.sunfire.com

Bob Carver's
Sunfire
from his mind ... and soul

test report

HIGH POINTS

Plays wide variety of disc formats.
Excellent picture and sound quality.
Good onscreen menu system.

LOW POINT

Won't play CD-RW discs
with MP3 files.

fast and furious cutting and (audio) scoring gave the DD-8020 a thorough workout.

In Chapter 5, an Asian motorcycle gang appears out of nowhere. The percussive music, revving two-stroke engines, and squealing tires swirl around the sound field. Once the dust settles, a gentle wind wafts through the surround channels, but it's soon followed by a million rounds of machine-gun fire and the fiery explosion of a formerly sweet car. The DD-8020's surround sound decoder expertly sorted out all these various bits, placing the music, effects, and dialogue in their proper places.

Not to be outdone, the component-video output never missed a beat. The details in the nighttime scene looked quite sharp, and when the lime-green Eclipse exploded in fiery red-orange flames, there was no hint of color smearing or motion artifacts. The smoke lingering in the night air also looked realistic. In particular, the subtle gradations in the smoke looked smooth, without any abrupt block changes in video intensity caused by MPEG-2 video encoding (or decoding).

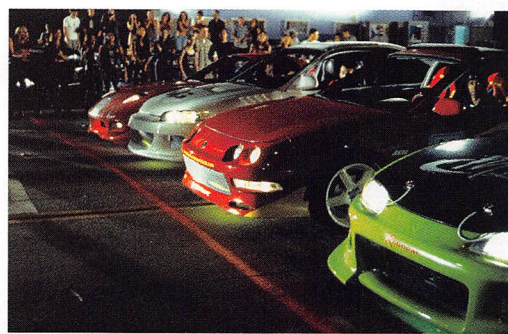
In Chapter 15, a rave party is in full swing at an outdoor racetrack. Two characters walk briskly against the complex background, and fine details, like strands of hair and threads in fabrics, are clearly visible even in the dim light. In short, the audio and video portions of this fast-paced movie both sounded and looked great as played on the DD-8020 using its progressive-scan video and multichannel analog audio outputs. Many DVD players have a hard time reproducing fine diagonal lines smoothly, without obvious "jaggies." The DD-8020's progressive-scan output with 2:3 pulldown was quite successful in this respect, with smooth

lines in this scene and only slight jaggies in specialized images on test discs.

I continued my listening session with the DVD-Audio release of Fleetwood Mac's classic *Rumours* (Warner). Compared with today's highly sampled, almost pointillistic pop music and its typically bright high end, this 25-year-old album sounds positively Wagnerian, with dark, dense melodies weaving in and out of the gloom.

In "Gold Dust Woman," there's relatively little interplay between the front and surround channels. Lead and backup vocals are placed in the front three channels and also in back, delayed and reverberated. Stevie Nicks's vocals, mixed at a relatively low level, growl out from the competing instrumental mix, which includes guitars in front and back and a rearward synthesizer.

The DD-8020 handled this dense mix extremely well. The sound quality was exactly right — suggestive and sweltering — with the player faithfully representing the



The fast and furious cutting and scoring of *The Fast and the Furious* on DVD gave the DD-8020's video and audio decoding a vigorous workout.

recording. While this particular album isn't the best example of creative six-channel mixing, it definitely verified the player's ability to deliver six excellent-sounding channels. My only DVD-Audio-related quibble is that the player was too leisurely at cueing up tracks.

Technological evolution will not be denied. The DD-8020 is a prime example of how features and performance increase and improve each year. This player shows that progressive-scan video and DVD-Audio, and even MP3 playback, can coexist in a single package without compromise. All in all, Mitsubishi's DD-8020 DVD player delivers plenty of bang for the buck. **SSV**

in the lab

DVD-VIDEO PERFORMANCE

Measurements were made from a variety of DVD test discs, all through the player's composite-video output except as noted. Picture settings were adjusted for the most accurate output (see notes).

Maximum white-level error.....0 IRE (adjustable)

Setup level.....+7.5 IRE (adjustable)

Differential gain.....0%

Differential phase.....0°

Luminance frequency response

(re level at 1 MHz) at 4 MHz.....±0 dB
at 5 MHz.....±0 dB
at 6 MHz.....-0.2 dB
at 6.75 MHz (DVD limit).....±0 dB

Onscreen horizontal resolution.....540 lines

In-player letterboxing.....poor

DVD-AUDIO PLAYBACK

All tests were done using a custom-made test DVD-R of computer-generated test signals containing dither, which sets limits on measured distortion and noise performance. Results are representative, not necessarily worst-case. The kHz figures in the frequency-response test conditions (left) represent the sampling rate of the digital signal.

Maximum output.....2.05 volts

Noise level (re -20 dBFS, A-wtd, 24-bit signals) all sampling rates.....-88.7 dB

Frequency response

48 kHz.....20 Hz to 21.3 kHz +0, -0.14 dB
96 kHz.....20 Hz to 42.1 kHz, +0, -0.64 dB

Excess noise (re perfect 24-bit performance) all sampling rates.....+34.6 dB

Noise modulation

all sampling rates.....<0.5 dB

The Mitsubishi DD-8020 proved to be an almost perfect CD player on the test bench, with all CD results (omitted here for space) at or extremely close to theoretical performance limits. DVD-Audio behavior was also very good, with the equivalent 18-bit noise levels being a substantial improvement over even perfect CD performance. I suggest bypassing the player's onboard Dolby Digital (DD) decoder, using instead its digital output to feed DD signals to an external decoder (perhaps in your receiver or preamp/processor) because the onboard

bass management limits output levels to 10 dB below their potential maximum.

Video performance was almost completely superb, as attested to by the outstanding luminance frequency response (set color to -7 and contrast to +1 for a lab-accurate composite-video output signal). In-player letterboxing was, however, typically poor, and the 20-nanosecond timing errors found in the component output (not listed above) could produce slight fringing effects to the sides of colored objects.

— David Ranada





Rotel

RSX-1065 Digital Surround Receiver



Rotel's top-of-the-line A/V receiver, the RSX-1065, is an imposing device in several ways. At 7½ inches in height, it's taller than most other receivers we've tested recently, and the strong vertical impression is reinforced by the heat-sink fins at either side of the control panel. Inside, the design is equally striking. Through the top-panel vents you can see the centrally mounted power transformer, a toroidal device that provides several benefits, not least of which is reduced size and weight without compromises in output power. Despite its overall size, the Rotel isn't as heavy or as difficult to move around as other receivers of its power rating.

The ample power rating doesn't tell the whole story, however. Although it has only five amplified channels, the RSX-1065 does perform 6.1-channel decoding of

Dolby Digital Surround EX and DTS-ES Matrix and Discrete soundtracks — the decoded back surround signal goes to two line-level outputs on the rear panel. For 6.1-channel playback, you'll need to connect these outputs to an external power amplifier, or the power-amplifier stage of a stereo integrated amp or receiver, feeding one (6.1-channel) or two ("7.1-channel") back surround speakers.

Other surround sound features include DTS Neo:6 and Dolby Pro Logic II (DPL II) processing as well as four digital signal processing (DSP) ambience modes, labeled simply Music 1 through Music 4 (what? no Stadium?). Rotel recommends leaving DPL II on for everything except 5.1/6.1-channel programs.

When you start hooking up the receiver, you'll run into a side benefit of its unusual height — the rear panel is relatively spa-

cious, with no crowding of the connectors. Especially noteworthy: the speaker binding posts get their own strip of space along the bottom of the panel instead of being crammed into the usual finger-pinching, short-circuit-promoting cluster. This makes speaker hookup extremely easy if you use anything but banana plugs. Unfortunately,

fast facts

RATED POWER 100 W x 5 into 8 ohms from 20 Hz to 20 kHz with less than 0.05% THD, all channels driven

DIMENSIONS 17⅞ inches wide, 7½ inches high, 15¾ inches deep

WEIGHT 48 pounds

PRICE \$1,999

MANUFACTURER Rotel of America, Dept. S&V, 54 Concord St., North Reading, MA 01864-2699; www.rotel.com; 978-664-3820



the posts don't have perpendicular holes to accept bare wires or pin connectors, making these less reliable than other types of connections.

Setting up the receiver's adjustable parameters was as simple as hooking it up to source components and speakers. You have the normal choice of speaker "size" for all channels, even for the back surround(s), which participate fully in any bass management. You also get a nice selection of subwoofer-output crossover frequencies (40, 60, 80, 100, or 120 Hz) and the option of turning off the low-pass filter on the subwoofer output altogether so it supplies a full-bandwidth signal (the main-channel high-pass filters are set to 100 Hz if you choose this option). Depending on your room, where you put your subwoofer, and the characteristics of the subwoofer's own low-pass filter, this option may make it easier to get a smooth blend between the subwoofer and the main-channel speakers.

The setup task was immeasurably aided by the well-designed onscreen menus, Rotel's unusually well-written user's manual,

key features

- Dolby Digital Surround EX and DTS-ES Matrix/Discrete decoding for 5.1/6.1-channel soundtracks
- Dolby Pro Logic II and DTS Neo:6 processing for 5.1-channel playback from stereo and Dolby Surround sources
- 2 optical, 3 coaxial digital audio inputs; 1 optical, 1 coaxial output
- 2 wideband component-video inputs, 1 output
- 5 A/V inputs and 4 outputs, all with S-video
- 2 analog audio-only inputs; 1 record output
- 7-channel analog audio input and preamp-out jacks
- Banana-plug-compatible, multiway binding posts for all speaker outputs
- 2 line-level outputs for back surround signal(s)
- AM/FM tuner with 30 presets
- Multiroom stereo audio output
- Universal/programmable backlit infrared system remote control can operate up to 9 components
- RJ-45 serial ports to operate receiver via computer or Rotel A/V keypad

and the universal programmable remote control, which features backlighting and hides controls for other components behind a slide-down panel. The manual takes pains to explain how the receiver works and why certain options should (or should not) be chosen. There are two paragraphs on the power switch alone! It fails, however, to mention the fine details of Dolby Pro Logic II operation (the receiver provides Cinema, Music, and Emulation modes, with the Music mode getting three adjustable parameters: Panorama, Dimension, and Center Width). And there was no mention at all of DTS Neo:6 (this feature was apparently added at the last minute). The manual also tends to over use the phrase "as a general rule."

As a general rule, then, I liked the RSX-1065. Its decoding of Dolby Digital and DTS soundtracks was excellent, and it cleanly and clearly delivered complex power punches, as in the last half hour of the first disc of *Pearl Harbor* or, for a completely different kind of cinematic frenzy, the first half hour or so of *Moulin Rouge*. The RSX-1065 had deeper power reserves than we usually find with 100-watt-per-channel A/V receivers, and it could deliver the full rated power, and then some, to all five channels at once, which is *very* unusual. Even the faded dialogue from the nicely remastered *Star Trek: The Motion Picture* ("Dammit Bones, I need you, badly!") was robust, while the sound effects and Jerry Goldsmith's outstanding musical score came across with nearly recorded-yesterday impact and clarity.

Multichannel recordings on the new high-resolution media, Super Audio CD (SACD) and DVD-Audio, also sounded fine — the receiver's ample power capabil-



The Rotel faithfully decoded the faded dialogue of the Enterprise crew from the DVD of *Star Trek: The Motion Picture*.

ities again proved their worth — except for a slight touch of added noise in the very quietest passages (see "in the lab"). Noise was also the limiting factor with so-called 20-bit CDs, which can, in theory, have background noise almost as low as SACD or DVD-Audio discs. For most listeners, who'll use volume-control settings lower than we do in our stress tests, and with almost all program material, the noise won't be noticeable. Like most current receivers, the RSX-1065 provides no bass management for its multichannel analog input, which could be a problem with some discs if you have small main-channel speakers.

Once I turned down the surround speakers a bit from their calibrated multichannel-balance settings — which you can do easily from the remote without having to turn on a TV to access the setup menus — the Music 1 through 4 ambience modes proved to be somewhat tame, which is good since they are otherwise not adjustable. DPL II was more useful than any of these modes, however, and it also scored over DTS Neo:6 by not producing any strange distortion effects on simple musical signals (a problem with Neo:6 that we've also noticed in previous tests of receivers offering both types of processing).

If the receiver had to be "stuck" in one



test report

multichannel ambience-generating mode, I'd agree with Rotel that it should be one of the DPL II settings. Even though the Dolby processing doesn't seem able to produce the extreme, and often exciting, redistribution of the sonic image among the front and surround speakers that Neo:6 can sometimes accomplish, at least it never sounds bad. Unfortunately, selecting the type of ambience processing employed, as well as fine-tuning DPL II's Music mode, requires turning on a monitor to see the onscreen display, which may be inconvenient.

Because it has relatively few "extra" features, the RSX-1065 was mostly easy to use. With power reserves suitable for producing cinematic sound levels even in large home listening rooms, this receiver

HIGH POINTS

- Impressive power reserves.
- Excellent multichannel playback.
- Easy to connect and set up.
- Excellent manual.

LOW POINTS

- Slightly elevated noise.
- Requires external amplifier for 6.1-channel playback.
- No bass management for multichannel analog input.

can be counted on to deliver solid performance—and it'll look the part, too, in your equipment rack. **SW**

in the lab

DOLBY DIGITAL PERFORMANCE

All data were obtained using computer-generated test signals containing dither, which sets limits on measured distortion and noise performance. Reference input level is -20 dBFS, and reference output is 1 watt into 8 ohms, obtained with the volume control set at 68. Dialogue normalization in test signals was -27 dB. Except for subwoofer-related tests, all speakers were set to "large," subwoofer on. Subwoofer-output crossover was set to 100 Hz. All are worst-case figures where applicable.

Output at clipping (1 kHz into 8/4 ohms)

1 channel driven.....129/228 W (21.0/23.5 dBW)
5 channels driven (8 ohms).....106 W (20.25 dBW)

Distortion at 1 watt

(THD+N, 1 kHz, 8 ohms).....0.03%

Noise level (A-wtd, 16-bit signal)

-71.1 dB

Excess noise (with sine tone)

16-bit (EN16).....+4.85 dB

Frequency response

20 Hz to 20 kHz +0.58, -0.0 dB

Subwoofer-output frequency response

24 dB/octave above -3-dB point of 100 Hz

High-pass-filter frequency response

12 dB/octave below -3-dB point of 100 Hz

Maximum unclipped subwoofer output

(at reference volume setting).....5.4 volts

Subwoofer distortion (from 6-channel, 30-Hz,

0-dBFS signal played at reference level; all

trims at 0 dB).....0.08%

The best results I got out of the Rotel RSX-1065 on the test bench were for output power, which showed impressive reserves. I also noticed that the line voltage didn't sag as rapidly in the clipping tests as it has with other receivers.

In other areas performance was very good, if not absolutely top-class. Noise levels in all operating modes were a bit higher than I've seen from other top-of-the-line receivers. This

STEREO PERFORMANCE, DIGITAL INPUTS

Test signals incorporated dither. Volume setting for reference output level was 68. All measurements were made in stereo mode with tone controls centered, speakers set to "large," subwoofer off.

Output at clipping (1 kHz)

8 ohms.....120 W (20.75 dBW)

4 ohms.....195 W (23.0 dBW)

Distortion at 1 watt (THD+N, 1 kHz)

8/4 ohms.....0.023/0.03%

Linearity error (at -90 dBFS).....

-0.4 dB

Noise level (16-bit signals, A-wtd).....

-73.4 dB

Excess noise (with/without sine tone)

16-bit (EN16).....+3.95/+3.95 dB

quasi-20-bit (EN20).....+21.3/+21.3 dB

Noise modulation

0.4 dB

Frequency response

20 Hz to 20 kHz +0.54, -0.01 dB

MULTICHANNEL ANALOG INPUT PERFORMANCE

The reference input level is 200 millivolts. The reference output level is 1 watt into 8 ohms, obtained with the volume set to 68.

Noise level (A-wtd).....

-77.8 dB

Frequency response

20 Hz to 100 kHz +0.6, -2.65 dB

noise may be slightly audible in ultracritical conditions and is surprising in the case of the multichannel analog input. To preserve the potential dynamic range provided by present-day DVD-Audio and SACD players, I prefer to see a noise reading of -85 dB or lower, even though today's multichannel music recordings themselves are rarely this quiet. The subwoofer output was clean when the receiver was playing worst-case test signals. **—D.R.**

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DC & Washington Suburbs: Myer-Emco.
DE - Hi Fi House: Wilmington.
FL- Absolute Sound: Winter Park • Audio Center: Deerfield Beach • The Audiohouse: Vero Beach • A/V in Paradise: Key West • A/V Home Theater: Clearwater • Bob's TV: Ocala area • Hovl Stereo: Jacksonville • Sound Components: Coral Gables • Seagull Electronics: Juno Beach • Sound Ideas: Gainesville • Sound Insights: Ft. Pierce • Stereotypes: Daytona Beach.
GA- Georgia Home Theater: Atlanta • Audio Warehouse: Savannah • Evolution Home Theater: Atlanta • Ken's Stereo: Macon • Merit TV: Columbus • Stereo Connections: Valdosta • Stereo Shop: Martinez.
HI- Honolulu Home Theater: Honolulu.
IA- Ultimate Electronics: Cedar Rapids, Davenport, Des Moines • Archer Audio Video: Ft. Dodge • Audio Visions: Sioux City • Hawkeye Audio: Iowa City, Cedar Falls • Renier's: Dubuque • Sound World: Mason City.
ID- Ultimate Electronics: Boise.
IL- Barretts Home Theater: Bloomington, W. Dundee, Aurora • Good Vibes: Bloomington, Champaign • Jon's Home Ctr.: Quincy • Music in Motion: Chicago Heights & Crestwood • Sound Forum: Crystal Lake • State Line Satellite: Rockford • Sterling Electronics: Sterling • Sundown A/V: Springfield • The Shoppe: Bradley.
IN- Classic Stereo: Ft. Wayne • Mishawaka • Kings Great Buys: Evansville • Ovation Audio: Clarksville, Indianapolis, Lafayette.
KS- Accent Sound: Overland Park • Advance Audio: Wichita • Audio Junction: Manhattan.
KY- King's Great Buys: Owensboro • Ovation Audio: Lexington, Louisville.
LA- Absolute Audio Video: Lafayette • Alterman Audio: Metairie • Home Theater Concepts: Slidell • Mike's Audio: Baton Rouge • Wright's Sound Gallery: Shreveport.
MA- Nantucket Sound: Hyannis • Percy's: Worcester • Pittsfield Radio: Pittsfield.
MD- Gramophone: Baltimore, Columbia • Myer-Emco: Frederick, Gaithersburg, Beltsville, Rockville • Soundscape: Baltimore.
ME- New England HiFi: Scarborough.
MI- Contemporary Audio: Okemos • Pecar's: (Detroit) Troy • Classical Jazz: Holland • Court St. Listening Room: Saginaw • Home Entertainment Store: Kalamazoo • Paragon Sound: Ann Arbor • Superior Sound: Grand Rapids • Today's Audio: Flint.
MN- Audio King: Minneapolis & Suburbs, Rochester, St. Cloud • Audio Designs: Winona.
MO- Independence A/V: Independence • Sound Central: St. Louis • Ultimate Electronics: Ballwin, Brentwood, Bridgeton, Fenton.
MS- Ideal Acoustics: Starkville • McLelland TV: Hattiesburg • Players A/V: Ridgeland.
MT- Rocky Mt. Hi Fi: Great Falls • Vann's Inc.: Missoula, Helena, Bozeman, Hamilton, Kalispell, Billings, Butte.
NC- Audio Unlimited: Jonesville • Audio Visions: Wilmington • Now Audio Video: Durham, Greensboro, Raleigh, Winston Salem • Sound Systems: Charlotte, Fayetteville • Tri City Electronics: Conover.
NE- Custom Electronics: Omaha, Lincoln.
NH- State Street Disc.: Portsmouth.
NJ- 6th Avenue Electronics: Springfield, Livingston, East Brunswick, Woodbridge, Paramus, West Longbranch, West Paterson • Camera and TV Stop: Medford • Monmouth Stereo: Shrewsbury • Woodbridge Stereo: West Caldwell, Woodbridge.
NM- Ultimate Elect.: Albuquerque • Sound Ideas: Albuquerque.
NV- Ultimate Elect.: Las Vegas.
NY- Audio Breakthroughs: Manhasset • Audio Den: Lake Grove • Clark Music: Albany, Syracuse • Stereo Exchange: Manhattan • Hart Elect.: Vestal • Listening Room: Scarsdale • Media Room: Bedford Hills • Park Ave. Audio: Manhattan • Rowe Camera: Rochester • Speaker Shop: Amherst.
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RI- Stereo Discount Ctr.: Providence.
SC- Audio Warehouse: Beaufort • Custom Theater & Audio: Murrells Inlet • Upstairs Audio: Columbia.
SD- Audio King: Sioux Falls • Sound Pro: Rapid City.
TN- College HiFi: Chattanooga • Good Vibrations: Cookeville • Hi Fi Buys: Nashville • Now Audio Video: Knoxville • Modern Music: Memphis • Sound Room: Johnson City.
TX- Audio Video: College Station • Bunkley's Sound Systems: Abilene • Bjorn's: San Antonio • High Fidelity: Austin • Home Theater Store: Arlington, Austin, Houston, Dallas • Krystal Clear: Dallas • Marvin Electronics: Ft. Worth • Matt Pantler Home Theater: Waco • Mike Massey, Inc.: Odessa • Sound Quest: El Paso.
UT- Crazy Bob's: St. George, Cedar City • Ultimate Elect.: Layton, Murray, Orem, Salt Lake City.
VA- Myer-Emco: Fairfax, Falls Church, Sterling, Tyson's Corner • Audio Connection: Virginia Beach • Audiometrics: Roanoke • Home Media Store: Richmond.
WA- Bunch-Finnegan TV: Kennewick • Magnolia HiFi: Seattle & Suburbs, Tacoma, Silverdale, Spokane • Pacific Sight & Sound: Wenatchee.
WI- Audio Video Pros: Onalaska • Flanner's A/V: Milwaukee • Hi-Fi Heaven: Green Bay • Sound World: Wausau • Team Electronics: Manitowoc • Puerto Rico: Precision Audio: San Juan.
Canada- Advance Electronics: Winnipeg • Air Waves Radio & TV: Moosejaw, SK • Audio Express: Saskatoon, SK • Bay Bloor Radio: Toronto • Canadian Sound: Brampton, Ont. • Digital Dynamics: Abbotsford, B.C. • Environment Electronics: Westmont, Ont. • K&W Audio: Calgary • Kolbasson: Montreal • La Boutique Electronique: Montreal • Lipson's Elect.: Newmarket, Ont. • Stereo Plus: Ottawa, Ont. • Stereoland: Windsor, Ont. Mexico- Contact Grupo Volumen: Mexico City.

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Velodyne Acoustics

SPL-523 Center Stage Speaker System



of its three SPL subwoofers and sent us not one but two models to check out for this review. The SPL-800 has an 8-inch driver and is no bigger than a hatbox, while the larger, more powerful (and costlier) SPL-1200 has — you guessed it — a 12-inch driver.

Both subs have only speaker-level inputs, with no speaker-level high-pass output (so you can't feed the front left/right satellites through the sub). Otherwise they are well equipped, with level and frequency knob controls, phase-reverse, crossover-bypass, and auto-on switches, and stereo line-level input and output on pairs of RCA jacks. The line outputs incorporate a relatively mild 6-dB-per-octave high-pass filter fixed at 80 Hz, but most people will just use the low-pass-filtered subwoofer output of their A/V receiver or preamp/processor and won't need to feed the signal back for amplification.

I placed the left and right SPL-523 satellites on small stands, about 4 feet from the wall, that elevated the tweeters roughly to my ear level when seated in the listening position. The center-channel satellite, ori-

Full disclosure: I'm not particularly well disposed toward "home theater in a box" systems with small satellite speakers like the SPL-523 in Velodyne's Center Stage system.

The tiny "woofers" in these satellites usually struggle to go low enough to blend effectively with the subwoofers, which all too often results in poor bass performance. I also admit that on initial inspection I found the SPL-523's appearance, well — *odd*. All of which goes to show how prejudice can mislead you: the Velodyne sextet turned out to be one of the better pint-sized home theater speaker suites that I've encountered.

I still think the satellite is kind of funny-looking, though — endearingly so. About the size of a quart milk bottle, it's roughly tubular with an off-center bulge along one side to accommodate the tweeter, which sits between two identical "woofers." Specified as 3-inch drivers, the woofers are closer to 2½ inches in diameter — too small to reproduce most frequencies below the midrange. Velodyne packs five of these minis, whose plastic enclosures can be had in black or white, in a single carton *sans* subwoofer. Each has a base and mounting arm attached with a ball swivel, which per-

mits vertical or horizontal placement either on a wall or atop a shelf or TV. The speakers use push-terminal connectors that accept banana plugs as well as bare wires.

To handle the bass part of the sonic equation, Velodyne recommends using one

fast facts

	SPL-523 (satellites)	SPL-800 (subwoofer)	SPL-1200 (alternate sub)
TWEETER	¾-inch dome	—	—
WOOFER	two 3-inch cones	8-inch cone	12-inch cone
ENCLOSURE	sealed	sealed	sealed
POWER	—	600 watts	750 watts
INPUTS AND OUTPUTS	gold-plated binding posts	gold-plated RCA line- and speaker-level inputs; high-pass-filtered RCA line-level output	As SPL-800
DIMENSIONS (WxHxD)	5 x 10 x 5 inches (11½ inches high with stand)	10 x 10 x 11 inches	14½ x 14¾ x 15¾ inches
WEIGHT	6½ pounds	33 pounds	59 pounds
FINISH	white or black	black	black
PRICE Total: \$1,698 or \$2,098	\$799 for five	\$899	\$1,299
MANUFACTURER Velodyne Acoustics, Dept. S&V, 1070 Commercial St., Suite 101, San Jose, CA 95112; www.velodyne.com ; 408-436-7270			

ented horizontally at first, went on top of my Princeton Graphics AF3.0HD wide-screen TV.

I've pretty much given up trying to predict what setup will give the smoothest blend between the subwoofer and small satellites in any system like this one. Despite the diminutive size of the SPL-523s, the Velodyne system clearly sounded its best when I ran the satellites full-range from my receiver (by selecting "large" in the bass-management setup) and used the sub's crossover control to set its low-pass point. This was true with either Velodyne subwoofer, connected through either its speaker- or line-level input.

In the end, the Velodyne system's bass-to-midrange blend was remarkably good. As long as the sub remained in a favorable position — no more than a few feet from one or the other front speaker — and was not pulled out beyond the plane defined by the three front speakers, localization was not a problem. The progression from sub-dominated bass notes to satellite-dominated midrange tones was unexpectedly smooth and free of gaps or bloat.

Higher up in frequency, the Velodyne system had a well-judged musical balance. With two-channel music playing through just the front L/R satellites and the subwoofer, they walked the line between warm and neutral, sounding discernibly brighter than one of my current reference speaker systems (the "smooth" one) but markedly darker than my second reference system (the "analytical" one). Both male and

female voices sounded pleasingly natural and even, without any notable "honk," dryness, "hoo," or spittiness.

For example, on the sumptuously recorded vocals of India.Arie's "Interlude" from *Acoustic Soul* (Uptown), the SPL-523 setup had no trouble conveying her wide range of subtle vocal inflections, breath sounds, *routlades*, and 16th-note, Edith Piaf-style vibrato. Given the excellent sub/sat blend, fuller-range cuts sounded just as fine even with the little SPL-800 sub. And what a pleasure it was to hear a modern pop album recorded more or less naturally, with real drums — not drum machines — that are allowed to *sound* like real drums! The Velodyne speakers did a great job with the in-your-face but unhyped sound of snare-drum rim-shots and high-hat rides, making them present and



The Velodyne system solidly reproduced *Pearl Harbor*'s bombastic effects, though the surrounds sometimes called attention to themselves.

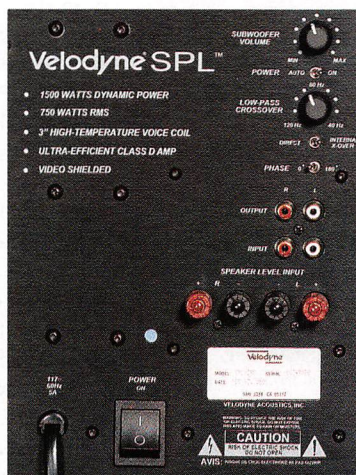
punchy without any artificial sizzle or splat.

After listening for a while, I concluded that the satellites sounded decidedly better placed vertically with the tweeters to the outside (as the manual subtly recommends). They didn't sound quite as open with the tweeters facing in, and when I turned them horizontally, the midrange was a bit colored. They also sounded best when I carefully positioned them to match my head height at the listening position.

The SPL-800 subwoofer is a mind-blower. This dinky little sub has got to give the most slam per cubic foot I've encountered short of the really big-bucks, superpowered microsubs. At its \$899 UMRP ("unilateral minimum retail price" — no kidding!),

it's more than a fair deal. Mining the "extras" chapter of the new *Sound & Vision Home Theater Tune-Up* DVD for "bass cows" proved rewarding. The low bass in the various THX, Dolby Digital, and DTS demos revealed the SPL-800 to be an unexpectedly capable sub, with solid deep-bass response (below 30 Hz) and plenty of output to keep pace with the SPL-523 satellites. Its bottom-octaves extension and oomph were also impressive — it didn't sound very different from my more expensive 12-inch reference sub, which has four times the cubic volume.

Substituting the larger SPL-1200 sub, which also has a 12-inch driver plus 25%



Clockwise from top left: the SPL-1200 rear panel, the SPL-800 rear panel, the SPL-800, and the SPL-1200.



test report

HIGH POINTS

Fine, accurate sound for both music and movies.

Powerful, super-compact

SPL-800 subwoofer.

Flexible placement, mounting.

LOW POINTS

Substantial off-axis tonal shift when center speaker is placed horizontally.

Satellites look odd.

more power than the small sub, changed things surprisingly little. While the SPL-1200 goes measurably lower than the 8-inch SPL-800 (see "in the lab"), I heard no dramatic difference in my setup. However,

as expected, the bigger sub could play audibly louder. At the edge of the satellites' dynamic limits, where the SPL-800 also began falling away (presumably because its amplifier deliberately limited its output to prevent distortion), the SPL-1200 kept happily pumping away. (I noticed this because the bigger sub awakened room rattles that the little one hadn't quite reached.) And it did so without any sign of hitting its own limits.

All of these virtues, of subs and sats alike, translated directly to movie playback. The soundtrack of director Michael Bay's *Pearl Harbor* — a truly wonderful DVD production, both picture and sound, of a howlingly awful movie — was presented with a rock-solid, well-knit front stage and smooth, full sound from deep

bass to top treble. Voices were natural and even, with just a hint of emphasis in the "presence" region (though I didn't detect such coloration with music). The effect was sharpened-up consonants and aspirants — which probably made the dialogue more intelligible. The Battle of Britain dogfight scene immediately demonstrated the DVD's superb effects mix, and the Velodyne system presented it with impressive faithfulness. (I sat through the whole of this turkey, which surely has the highest CPM — that's clichés per minute — count of any recent movie, only because of Kate Beckinsale. Sigh.)

Now, I hate to sound like a broken record — er, servo-failed CD player — but if this Velodyne array has any notable weaknesses, they are the same two that are all but endemic among small-satellite/subwoofer systems. First, while the SPL-523 satellites worked perfectly well in the rearward surround positions, they called attention to their locations slightly more than my everyday bipolar surrounds, particularly in the innumerable zoom-bys in *Pearl Harbor*'s climactic attack scene. Second, deployed horizontally for the center channel, the SPL-523 suffered from the same off-axis colorations as most other horizontal center speakers. When I sat 30° or so off-center, voices sounded markedly less open and clear.

Fortunately, since the satellite is only 10 inches long, the solution to the second problem is obvious: stand the center speaker on end like the left-right pairs, using either the supplied, swivel-mounted stand or, as I did, small stick-on rubber feet (not supplied) to minimize overall height. Vertical placement virtually eliminates the off-axis coloration, and though you might think the result looks funny, the sound is clearly preferable.

So here's another bantam-weight home-theater-in-a-box (well, two boxes) speaker system. Ho, hum — except that Velodyne's, whatever you think of its looks, sounds very good indeed. And the price, though beyond the "magic" \$999 figure, is hard to argue with — especially if you insist on truly compact speakers. You won't really need the bigger, more expensive SPL-1200 subwoofer unless you have an oversized room or just want a system that can play louder and lower. Either way, if you seek out Velodyne's Center Stage setup for an audition, I'll wager that you'll be glad you did.

S&V

in the lab

Frequency response (at 2 meters)

front left/right105 Hz to 16.6 kHz ± 3.5 dB
center105 Hz to 16.5 kHz ± 2.8 dB
surround105 Hz to 15 kHz ± 3.2 dB
SPL-800 subwoofer60 Hz to 120 Hz ± 2.7 dB
SPL-1200 subwoofer...45 Hz to 100 Hz ± 2.9 dB

Sensitivity (SPL at 1 meter with 2.8 volts of pink-noise input)

satellite90 dB

Impedance (minimum/nominal)

satellite3.7/8 ohms

Bass limits (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)

satellite80 Hz at 67 dB SPL
SPL-800 subwoofer25 Hz at 75 dB SPL
91 dB average SPL from 25 to 62 Hz
102 dB maximum SPL at 62 Hz
SPL-1200 subwoofer20 Hz at 75 dB SPL
104.8 dB average SPL from 25 to 62 Hz
110.5 dB maximum SPL at 62 Hz

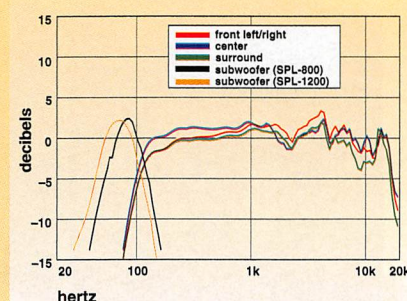
All of the response curves in the graph are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. Since the same SPL-523 satellite is used all around, the differences in the curves for the front left/right, center, and surround speakers merely reflect the averaged response with the different listening windows and orientations. The speaker was measured vertically for the L/R channels, horizontally for the center channel.

Oriented vertically, the SPL-523 had uniform directivity out to 30° off-axis. It showed some disturbance at 4 kHz and a tweeter peak at 13 kHz. At radiating angles greater than 30°, output tended to dip below 10 kHz, but the tweeter resonance remained prominent. Because the tweeter is offset to one side of the baffle, response differed slightly depending on which side the microphone was closer to.

When the SPL-523 was measured in horizontal orientation, its output was uniform to 22.5°, but at wider angles a wide notch developed at 4 kHz. A notch like this is common with horizontally arrayed speakers, but the Velodyne's was somewhat more pronounced than usual. (There was no such notch, of course, when the speaker was measured in its vertical orientation.) The speaker had limited low-bass capability in either orientation.

Bass limits for each subwoofer were measured with it set for maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL) than the figures given here. The SPL-800 sub had more extended response at the low end than most small-box subs. Its overall capability was modest but well matched to the dynamics of the SPL-523. The SPL-1200 played significantly louder and deeper. Both subs had limited extension into the midrange and steep, 24-dB-per-octave crossover slopes. Most of the action of their crossover controls clustered in the 80- to 120-Hz region, and full rotation of the crossover control produced an 8- to 10-dB change in output level.

— Tom Nounsaine



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SonicBlue

ReplayTV 4000 Video Hard-Disk Recorder



Using the Commercial Advance feature of ReplayTV's 4000 series hard-disk recorder (HDR), I made the following blocks of commercials from a recent broadcast of *E.R.* on NBC go *poof!* in the blink of an eye — and without having to touch the remote during the program: Aveeno moisturizing lotion, *The Count of Monte Cristo*, Toyota, Tylenol, Prego pasta sauce, and *Third Watch* (3 minutes total); *Birthday Girl*, Verizon Wireless, Kentucky Fried Chicken, Volkswagen, the Golden Globe Awards, Singulair asthma medicine, and *Crossing Jordan* (3:40); Charles Schwab, *Gosford Park*, Pillsbury cookies, *Roots: Celebrating 25 Years*, News Channel 4, Saab, *The New York Times*, *Weight Watchers*, *The Fast and the Furious* (on DVD), McDonald's, and Dodge (4:20); Computer Associates, *Black Hawk Down*, Royal Caribbean, Saturn, Campbell's soup, Maybelline, Ocean Spray, *The Tonight Show*, *Late Night with Conan O'Brien*, and *Law & Order: SVU* (4:00). Total time recouped: 15 minutes. No wonder NBC and other net-

works are suing SonicBlue, which makes the ReplayTV 4000.

The four models in the 4000 series vary only in hard-drive size and price. I tested the RTV4080 (\$999), which contains an 80-gigabyte (GB) hard drive and holds up to 80 hours recorded at Standard Quality (maximum compression). The others are the RTV4040, which holds up to 40 hours; the RTV4160, with a 160-hour capacity; and the RTV4320, with space for 320 hours.

The 4000 series HDRs are the first from ReplayTV without built-in dial-up modems. Instead, they're designed to connect to a home network with the supplied 10-foot Category 5 cable, which plugs into the RJ-45 port on the back. The other end plugs into the "residential gateway" or Ethernet router provided by your broadband supplier. (Ad-skipping models that don't need broadband are expected later in 2002.)

Except for the addition of progressive-scan (VGA) video and optical digital audio outputs, the A/V connections are the same as on previous ReplayTV models. I bypassed the internal tuner and used the

fast facts

KEY FEATURES

- Can automatically skip commercials during playback of recorded programs or those watched live after a delayed start
- Can transmit recorded program to other ReplayTV 4000 users via Internet
- Multiple units on a home network can share programs
- 40- to 320-GB hard drive stores maximum of 40 to 320 hours of programs at Standard Quality

INPUTS/OUTPUTS (all rear panel): two composite-video inputs and outputs; S-video input and output; two pairs of analog stereo audio inputs and outputs; RF antenna input and output; progressive-scan (VGA) output; optical digital audio output; infrared emitter; serial port; Ethernet port

DIMENSIONS 17 inches wide, 3¼ inches high, 14 inches deep

WEIGHT RTV4040 and 4080, 11 pounds; RTV4160 and 4320, 12¾ pounds

PRICES RTV4040, \$699; RTV4080, \$999; RTV4160, \$1,499; RTV4320, \$1,999

MANUFACTURER SonicBlue, Dept. S&V, 2841 Mission College Blvd., Santa Clara, CA 95054; www.sonicblue.com; 877-737-5298

supplied infrared emitter to relay channel changes to my cable-TV box. Because the ReplayTV 4000 accommodates both TV programs and digital photographs, you need to choose how much storage space to allocate to each. I went with the default of 79 GB for TV and 1 GB for photos.

Once I'd answered the setup questions, the HDR automatically downloaded a two-week program guide listing some 350 channels I had access to from my cable system. Since the download went ten times as fast as with the dial-up modem in my previous ReplayTV, I was able to complete the entire installation in about half an hour. First-time ReplayTV users will probably spend considerably more time.

I was now ready to start enjoying TV without commercial interruption. Commercial Advance has been available in a less turbo-charged way in some VCRs since the mid-'90s. It works by identifying the pairs of black frames and silent gaps, typically spaced 30 or 45 seconds apart, that separate commercials and marking each one as an advertising block to be skipped over during playback. Previous ReplayTV models offered only a QuickSkip button to jump ahead in 30-second increments. The new ones also let you press QuickSkip or fast forward manually, backing up as needed. The advantage of leaving Commercial Advance on all the time is that you can keep your hands in the pretzel bag without the bother of reaching for the remote.

But not even ReplayTV can get ahead of the broadcaster's schedule: unless the program you're watching was previously recorded, you'll need to delay beginning to watch it long enough for the automatic buffer to collect enough program content to make up for the commercials you'll be skipping. Given that commercials and station/channel promos add up to a significant chunk of each hour, you wouldn't want to begin watching a 10 p.m. broadcast of, say, *E.R.* much before 10:15. Otherwise you'd catch up to live TV — and live commercials — before the show was over. The great flexibility of hard-disk recording, though,

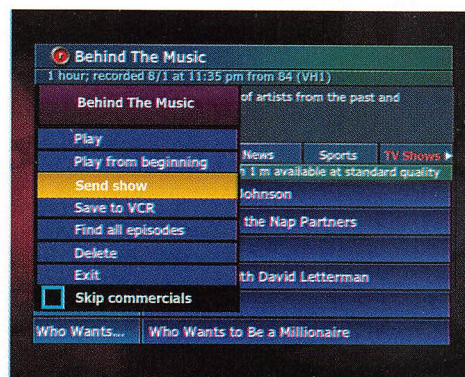
means that you can be watching anything saved to the drive while recording something entirely different.

So how well does Commercial Advance work? ReplayTV claims an overall 90% accuracy rate and promotes the feature as "enabling near-commercial-free television." My own experience using it for a month suggests that it works about 75% of the time. With a few shows, it failed entirely. My guess is that the broadcaster didn't provide any cue Commercial Advance could identify. Still, with many shows it worked perfectly. While it achieved 100% accuracy for that episode of *E.R.*, it left *CSI: Crime Scene Investigation's* first round of commercials intact but then successfully exorcised the rest.

With some shows Commercial Advance leapt over the opening theme song as well as the commercials. On some occasions it skipped the regular ads but played promos for upcoming shows. On three separate instances, Commercial Advance cut out the entire first minute of *Law & Order* after a block of commercials. I suspect this happened because the missing scenes, equal to two 30-second ad spots, were flanked by the show's signature nearly black screens, showing only a street address, that are used to introduce each scene.

To restore a missing scene, you can't simply press the reverse button — Commercial Advance leapfrogs what it perceives as ad blocks both coming *and* going. I had to turn off Commercial Advance with the toggle on the remote, *then* hit the reverse button until I found the end of the last commercial. (You can tell it's active because an arched arrow appears during a leap.)

The networks' lawsuit also cites another new feature of the ReplayTV 4000 series: the ability to send a recorded program — an episode of *Friends*, say, or footage of your kid's birthday party copied from your camcorder — to other ReplayTV 4000 users over the Internet. As I discovered, however, this involves overcoming some technical hurdles and, given upload time, might not be practical.



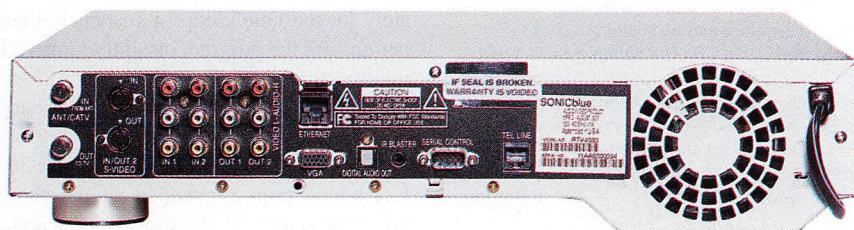
ReplayTV 4000 users can share recorded programs via the Internet with other users, but programs received this way can't be forwarded.

I tried sending a 4-minute clip from *Fantasy for Billiard Balls*, a movie that I made years ago but only recently transferred from film to DVD, to a ReplayTV user across the country. First I copied the scene to my RTV4080, but to either send or receive video through the Internet, I had to poke a hole in my home network's firewall. Lacking an in-house Teenage Information Officer (TIO), I called SonicBlue tech support, which assured me that I wouldn't be compromising the security of my computer but merely providing a conduit to the hard drive in the RTV4080.

The technician had me type strings of numbers into screens I'd never seen before on my bedroom computer and duplicate a code on the RTV4080 in the living room. Then I needed to enter the 15-digit Internet Serial Number of the other ReplayTV user — he gave it to me over the phone — in my Internet Address Book. I also gave him my 15-digit ISN to add to his IAB. Both units need to be turned on during setup so they can contact each other and confirm the additions to the two address books.

I was now ready to select Send Show from the ReplayTV pop-up menu. I chose *Fantasy for Billiard Balls*. The recipient must choose to accept the program before it can be transferred. When my West Coast buddy clicked okay, a status bar showing the percentage of the program received, updated every 4 megabytes (MB), appeared on his end. Some 20 MB and 27 minutes later, only 16% of my 4-minute clip (which I'd recorded at medium quality) had been received.

It took only about 10 minutes, however, to receive the 30-second local-news clip recorded at standard (lowest) quality that he sent me — download speeds using a cable modem are much faster than upload



test report

speeds, with cable systems typically limiting the upload to 128 kilobits per second. According to SonicBlue, you can expect a half-hour sitcom to take about 8 hours to transfer via the ReplayTV 4000 and a 2-hour movie about 32 hours, both at the lowest quality. While more efficient encode/decode systems have been developed for sending video over the Internet, ReplayTV utilizes MPEG-2, the same scheme used by DVD, digital TV, and digital satellite broadcasting, which have more generous bandwidths.

While it's easy to put down the Send Show feature as a capability ahead of its time and beyond the patience of most users (you don't need a TIO to mail a cassette), once set up, transfers can take place in the

background or overnight. Even while I was exchanging clips with the guy in California, I was recording *Enterprise* from cable TV and watching a previously recorded segment of *BBC News*.

I could have sent the same program to up to 16 ReplayTV 4000 users at once, but I can't resend a program that I received via my broadband connection — ReplayTV disables that option. Programs with commercials are sent intact so the recipient has the option of watching them.

SonicBlue has announced but not yet implemented a service from an Internet partner in which subscribers would be able to receive pay-per-view programs at transfer speeds that would surpass peer-to-peer transfers. Specific shows or movies could

HIGH POINTS

- Automatically skips most commercials.
- Programs stored on one HDR can be accessed from another.
- Can display still images in a slide show or whenever a TV program is paused.
- No monthly fees.

LOW POINTS

- Requires a broadband connection.
- Peer-to-peer program sharing is agonizingly slow.

be ordered from your computer but delivered to your set-top HDR.

One benefit of putting a ReplayTV 4000 on my home network was being able to view on my big-screen TV the dozens of digital photographs of my 18-month-old niece stored on my computer's hard drive. A photo-transfer utility downloaded from SonicBlue's Web site let me copy the still images to the RTV4080's hard drive, then use the HDR's remote to run a slide show. I also took advantage of the option to have a randomly selected image appear whenever I paused a TV program (after a few minutes it's replaced by ReplayTV's built-in screensaver).

Multiple ReplayTV 4000s can be supported on a home network. SonicBlue recommends naming each one for the room it's in — Living Room and Master Bedroom, say. Tabs show up in each device's Replay Guide so that a viewer in one room can watch video stored on an HDR in another. Suddenly the notion of carrying a disc upstairs to finish watching a movie is as quaint as handing a colleague a file on a floppy disk instead of letting him access it from the office network.

There are some less flashy features unique to the 4000 series that will make owners of previous ReplayTV models drool. A conflict-resolution screen lets you select which of two programs being broadcast at the same time you really want to record by pressing one button — you no longer have to first delete the program you don't want and then select the one you do want.

Jumping to a particular minute in a recording is now direct. For example, key in 23 on the remote control followed immediately by the QuickSkip or Instant Replay button, and the program instantly jumps 23 minutes forward or backward. Want to see what else is on without changing the channel or losing most of the screen to the program guide? Hitting the Description or Select button pops a synopsis of the show you're watching to the top of the screen,

IN THE LAB

VIDEO RECORD/PLAYBACK PERFORMANCE

Measurements were made from a variety of DVD test discs, played on a high-quality DVD player and recorded through the ReplayTV 4080's composite-video input. Where three values are given, they are for the three recording modes, High/Medium/Standard (see notes).

Luminance frequency response

(re level at 1 MHz) at 2 MHz±0/±0/-3.0 dB
at 3 MHz+0.42/+0.42/-15 dB
at 4 MHz+1.1/+1.1/NA dB
at 5 MHz+0.34/+0.34/NA dB
at 6 MHz-4.4/-4.4/NA dB
at 6.75 MHz (DVD limit)-15.0/-15.0/NA dB

Onscreen horizontal resolution

475/475/260 lines

ANALOG OUTPUT AUDIO PERFORMANCE

Reference input level for noise measurements is 0.1 volt. Results were the same in all recording modes.

The most relevant numerical results with respect to the ReplayTV 4080's video quality are those for luminance frequency response, which can be directly related to onscreen resolution. While the results in the High and Medium Quality recording modes were not quite as sharp as DVD-Video, they were more than a match for standard broadcast/cablecast NTSC video with its 480 lines of resolution at best. In Standard mode the frequency response was too low to measure at 4 MHz and above (the readings consisted only of noise and distortion), while the resolution dropped to little better than VHS tape.

Standardized lab tests tell only part of the story, however, when it comes to a data-compressing video medium. Using the same home-camcorder footage as in our recent comparison test of three DVD recorders (February/March 2002), I was able to assess

Maximum analog input1 volt

Distortion (THD+N, 0.1-volt input)0.09%

Noise level (A-wtd)-65.3 dB

Frequency response

20 Hz to 20 kHz +0.56, -1.1 dB

DIGITAL OUTPUT AUDIO PERFORMANCE

All test signals were recorded through an analog audio input and monitored via the optical digital output. Reference input level for noise measurements is 0.1 volt. Results were the same in all recording modes.

Sampling rate of digital output48 kHz

Maximum analog input

(for 0 dBFS output)1 volt

Distortion (THD+N at -20 dBFS)0.035%

Noise level (A-wtd)-69.0 dB

Frequency response

20 Hz to 20 kHz +0, -0.57 dB

the relative capabilities of the ReplayTV recorder's video encoding. The results were very good. As the resolution measurements imply, the High and Medium Quality modes looked just about identical and almost as good as the DVD recorders operated at their highest data rates. And even with its VHS-like resolution, recordings in Standard mode had fewer data-compression artifacts than those made by the DVD recorders at their lowest data rates.

Audio quality was very good, especially through the digital output, the main problem being a slightly elevated background hiss compared with a CD. The nonadjustable 1-volt input-overload level precludes making clipping-free dubs of CDs, since CD and DVD players usually have fixed 2-volt maximum outputs. If you want to record audio through one of the external inputs, the audio must be accompanied by a video signal. — David Ranada

but now if you immediately press the up or down arrow in the ring around the Select button, you can browse the synopses of programs on adjacent channels. The remote, which looks nothing like the one that came with the Showstopper ReplayTVs from Panasonic, has some lighted buttons and stands upright.

At some point your ReplayTV 4000 will fill up with recorded programs, and you'll need to decide which ones to delete to make room for new ones. You need to strike a balance between maximum image quality and maximum storage capacity. If you use the High Quality setting for all recordings, the RTV4080's 80-GB drive can hold only about 26 hours, compared with 80 hours at Standard Quality.

The rule of thumb has been that movies with a lot of action demand High Quality, but talking heads need only Standard Quality. After looking long and hard at examples of both recording modes, I'm convinced that Medium Quality gives results that are almost indistinguishable from High Quality, yet it lets you store more than 50 hours (nearly twice as much) on an 80-GB drive. I've set Medium Quality as my default, and it's rare that I opt for one of the other two modes. When I used this setting to dub *Fantasy for Billiard Balls*, the ReplayTV copy looked identical to the DVD. Blue chalk marks on the whites of the balls were as sharp and the real-object animation just as fluid as on the DVD.

The ReplayTV 4000 series offers the same forward frame-stepping capability and three speeds of slow motion as previous models — and is equally unable to do either function in reverse. It also has the identical fast-forward and reverse speed increments up to 20x. Where all HDRs take their own sweet time in the pedestrian action of switching stations using an external tuner. When I hook my digital cable-TV box directly to my set, I can change channels instantly with the box's remote. But with the ReplayTV 4000 hooked up between the box and the TV, each channel change takes 4 or 5 seconds to complete. Call it bicycle tuning in the jet age.

The thing about disruptive technology like the

ReplayTV 4000 is that there is no going back. Sure, it upsets the economic system broadcasters have put in place, but it is as much the broadcasters' choice to deluge us with commercials as it is the viewer's choice not to drown in them. Given that virtually anyone who starts using a video HDR finds it nearly impossible to give up being in control of how and when to watch

TV, broadcasters risk civil rebellion if they enlist the courts to put this most consumer-friendly technology since the remote control back in the bottle. If you subscribe to the notion that time is money, given that a ReplayTV 4000 returns, on average, a quarter of every hour you spend watching commercial TV, then it is — in a word — priceless.

S&V

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(*Sound and Vision*, November 2001)

"Powerful and dynamic sound; refinement; great value." -
(*What Hi-Fi?* - Pi-10, March 2001)

"Wharfedale may not be as widely known here on these shores as some of its British comrades, but the Pacific Series could change that. And deservedly so." -
(*Sound and Vision*, November 2001)

"What really impresses about the Pi-20s is their sound..." -
(*What Hi-Fi?* - Pi-20, March 2001)

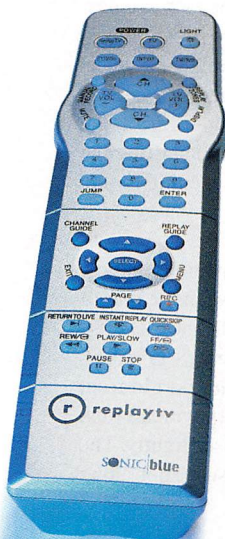
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Acoustic Energy

Aesprit Home Theater Speaker System



Before we begin, let me make one thing perfectly clear — I am partial to British speakers. I don't know why, and no one has ever offered to pay the therapist's fees to find out, but I've always been attracted to the particular blend of warm sound and mellow highs that, at least to my ears, the best British speakers can provide. So when a set of speakers from the U.K. arrives for review, I'm predisposed to like them — but I'm also going to set my bar of expectation quite high. Therefore, it was with positive bias and high hopes that I unpacked the Aesprit speaker system Acoustic Energy sent us for test, comprising two AE 309 front left/right speakers, an AE 307 center speaker, a pair of AE 300c surrounds, and an AE 308 subwoofer.

You can't rely on good looks when choosing speakers, but I don't have anything against nice-looking cabinets as long as

their higher cost doesn't cut into the quality of the drivers they hold. In this case, I was quite taken by the styling. Instead of boxes shrouded in black vinyl, the Aesprit speakers all sport finely made wooden cabinets with black ash or cherry wood veneer and floating gray cloth grilles. In addition, each speaker's front face has attractively beveled edges, at top and bottom on the center speaker and at the sides on the rest. At the bottom of each AE 309 tower is a black board (more formally known as a plinth) with beveled edges that serves as a base. Floor spikes are also provided in case you prefer them.

All of the main-channel speakers have the same soft-dome tweeter, ported cabinets, two sets of binding posts with removable shorting links (allowing for biampification), and woofers with alloy cones. The three front speakers each have two identical woofers, but they're actually

three-way designs — the crossovers present midrange frequencies to one woofer and bass frequencies to the other.

The AE 308 subwoofer has a front-firing 8½-inch paper-cone driver with an impressively massive surround. It's accompanied by four large rubber feet (not shown in our photo) that you must mount on the bottom of the cabinet to provide clearance for the downward-firing port. They also help decouple the cabinet from the floor to reduce vibration. The front panel has two dials for setting the sub's crossover frequency — calibrated from 35 to 180 Hz — and output level. Each knob has a hash mark that lights green when the sub is active and red when it's on standby. Around back are the speaker- and line-level inputs and outputs as well as slide switches for phase (0 or 180°) and power on/auto/off.

I liked having the level and crossover controls on the front. You usually need access to both when setting up a subwoofer because they interact. But the Aesprit designers also went a step further and made them remote controllable. In a world of complicated remotes, this one is simplicity itself with only four buttons: level up/down and crossover frequency up/down. About the toughest part of using this remote is remembering to point it at the subwoofer and not the TV.

I have auditioned plenty of home theater speaker systems in my room and pretty much know the best place for each speaker. I placed the Aesprit speakers in those optimal locations, wired the main channels conventionally (I didn't biamp the speakers), and used a line output to drive the sub. I spent some quality time shifting the speakers around, primarily listening for the best bass response.

I was careful to adhere to the advice given in the AE 309 owner's manual to allow at least 12 to 16 inches between the rear of these speakers and the wall. The AE 309s are shipped with foam "bungs," or plugs, in their rear ports (the smaller port in front of each speaker has no bung), which I took out to boost the bass response slightly. The sub found its way to the usual spot along

my front wall, between the center and left speaker.

I started my audition with a relatively light DVD-Audio workout, *Johann Strauss in Berlin* with the Berlin Philharmonic conducted by Nikolaus Harnoncourt (Teldec). These fluffy pieces won't stress anybody's woofers, but the strings and woodwinds will let you hear bad speakers a mile away. In the overture to *Die Fledermaus*, the orchestra is spread across the front three speakers — the recording makes a good case for why you need a center channel, as it helps firm up the imaging across the stage. The orchestra is also present in the surrounds, with a bit of reverberation to provide a sense of the hall.

The Philharmonie hall is fairly bright, and any extra brightness contributed by the speakers would make this recording sound positively tinny. The tweeters imparted a neutral sound to strings, which had a nice, sharp bite to them (listen to a violinist live and you'll hear what I mean), and the woodwinds had a nice presence. Neither sounded edgy or brittle. The brass had similarly good presence rather than the duller brass sound some speakers convey.

On the other hand, I thought the upper midrange lacked some detail, and there was a lack of clarity in the woodwinds that bothered me. Although the surround channels don't play a large role in this record-

ing, the AE 300c speakers did provide a good sense of hall ambience and surround. Finally, although the low-frequency demands of the disc are very modest, the front-speaker woofers did kick up a bit of dust in the overture's stirring finale. In short, the speakers passed my first test, one that many home theater speaker systems fail: they were able to reproduce unamplified classical music with a fairly natural sound quality.

I continued my audition with the 5.1-channel CD of Eric Clapton's *461 Ocean Boulevard* (DTS). This 1974 album represented a triumphant personal and professional comeback for Clapton after his dark heroin days. The DTS remix is a great example of how creative surround mixing can add something to music. The sounds from all six speakers combined in a naturally cohesive way throughout the album.

Clapton's cover of Bob Marley's "I Shot the Sheriff" was probably the first time that mainstream America had heard reggae. In the DTS remix, the front speaker trio carries vocals, guitar, damped drums, and some very snappy cymbal work. The cymbals have a wonderful interplay with another cymbal that someone put in the surrounds. The inspired effect really conveys



The Aesprit speakers did a good job of conveying the Civil War and Old West mayhem in the DVD soundtrack of *American Outlaws*.

the reggae rhythm, but it can work well only if the front speakers tonally match the surrounds. With their identical tweeters, the Aesprit speakers had this covered. Tasty.

In the same song, the surround channels carry more guitars, organ, heavily reverberated and distant vocals, and tom-toms. The toms are damped to create a kind of steel-drum sound — or at least the closest thing to steel drums you're likely to find in a blues/rock album. Not bad, but I'd have liked more bass from the surrounds. The sub, however, cranked out a very danceable reggae beat.

In "Mainline Florida" the front channels carry very dry vocals, a crisp high-hat, drums, organ, and some very funky backup vocals that play off the almost cheesy organ. The tweeters and midrange drivers in the AE 309s coped with these complex sounds, but I'd have liked just a bit more clarity in the vocals.

Finally, I turned to a DVD-Video disc, *American Outlaws* (Warner), a slow-moving, repetitive, nearly unwatchable movie that portrays Frank and Jesse James as Civil War heroes. At least it starts with a bang. The thud of rifle fire is everywhere, bullets whistle through the surrounds, and a Gatling gun sprays lead all over. An energetic musical score gallops along, mixed underneath the sound effects. A number of in-

fast facts

	AE 309 (front L/R)	AE 307 (center)	AE 300c (surround)	AE 308 (subwoofer)
TWEETER	1-inch soft dome	1-inch soft dome	1-inch soft dome	—
MIDRANGE	7-inch alloy cone	6-inch alloy cone	—	—
WOOFER	7-inch alloy cone	6-inch alloy cone	6-inch alloy cone	8½-inch paper cone
ENCLOSURE	ported	ported	ported	ported
POWER	—	—	—	200 watts
INPUTS AND OUTPUTS	biampable gold-plated two-way binding posts	biampable gold-plated two-way binding posts	biampable gold-plated two-way binding posts	line-level RCA and five-way binding-post speaker-level inputs and outputs
DIMENSIONS (WxHxD)	8¼ x 36¼ x 15½ inches	21 x 6¾ x 7¾ inches	7¼ x 11½ x 9⅞ inches	16⅞ x 14½ x 11½ inches
WEIGHT	39½ pounds	17½ pounds	13¼ pounds	46¼ pounds
FINISH	black ash or cherry wood veneer	black ash or cherry wood veneer	black ash or cherry wood veneer	black ash or cherry wood veneer
PRICE	\$1,299 a pair	\$499	\$549 a pair	\$1,199
Total: \$3,546				

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OFFICIAL ENTRY FORM

Return by May 15, 2002, to: Harman Kardon Bridge Sweepstakes,
P.O. Box 1222, Radio City Station, New York, NY 10101-1222

1. Who sang lead vocals on the Simon & Garfunkel song
"Bridge Over Troubled Water"? _____

2. The 1969 hit "Worst That Could Happen" was sung by what
band named for a New York City bridge? _____

3. The DAL 150 EzLink is a _____ to _____
link. (Check the photo or visit www.harmankardon.com.)

Name _____

Address _____

City _____

State _____ Zip _____

Daytime Phone (_____) _____

E-mail Address _____

test report

congruous sounds are added to punch up the excitement, as when Jesse tosses his six shooters aside and a strange ka-boing sound punctuates the action.

The Acoustic Energy system conveyed the sounds of battle with real gusto. The sound field was completely immersive, and I could practically feel the cannon balls fly past my head. The subwoofer boomed and blasted with every explosion, appropriately shaking my listening room, especially after I cranked it up a tad with its remote. In short, in this and other scenes, the Aesprit speaker system could handle all of the ordinance the movie could throw at it. I suspect it would sound just as good with almost any movie soundtrack.

Sometimes, preconceived notions don't hold true. These speakers are not designed in the traditional British mold. While they provide terrific imaging, good transient response, and a balanced timbre, and are certainly not harsh or brittle, they don't have that certain warmth I associate with my fa-

HIGH POINTS

Terrific imaging.
Good performance on soundtracks.
**Remote control for
subwoofer level and crossover.**
Great styling.

LOW POINTS

**Some midrange muddiness
in front L/R speakers.**
Relatively pricey.
Surrounds lack bass punch.

vorite speakers from across the pond. Perhaps their alloy-cone drivers trade that away for other desirable qualities. Still, even though they weren't what I expected, there's no denying the essentially neutral sound quality of the Aesprit speakers. Neutrality is something that just about any speakers, from any country, have a hard time achieving. **S&V**

in the lab

Frequency response (at 2 meters)

front left/right.....51 Hz to 17.6 kHz ± 5.0 dB
center.....82 Hz to 14 kHz ± 3.5 dB
surround.....78 Hz to 14 kHz ± 3.0 dB
subwoofer.....38 Hz to 155 Hz ± 2.8 dB

Sensitivity (SPL at 1 meter with 2.8 volts of pink-noise input)

front left/right.....89 dB
center.....90 dB
surround.....88 dB

Impedance (minimum/nominal)

front left/right.....4.5/8 ohms
center.....5.6/11 ohms
surround.....4.7/6 ohms

Bass limits (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)

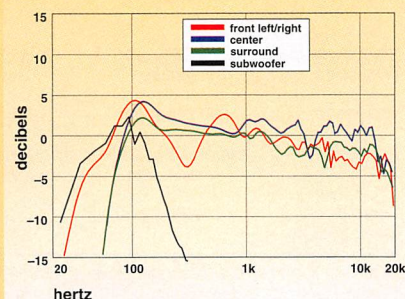
front left/right.....32 Hz at 82 dB SPL
center.....80 Hz at 89 dB SPL
surround.....62 Hz at 67 dB SPL
subwoofer.....25 Hz at 95 dB SPL
104.1 dB average SPL from 25 to 62 Hz
106.6 dB maximum SPL at 62 Hz

All of the response curves in the graph are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. Because the AE 309 is a tower speaker, all measurements were made with it standing on the floor. It had excellent low-frequency output and uniform response within our $\pm 30^\circ$ listening window. There was the usual 300-Hz floor-reflection notch, and the gently falling bass to treble balance was relatively smooth above 500 Hz. The measurements given here reflect performance with the plug removed from the larger rear port. There was essentially no

measurable difference in frequency response with or without the plug above 50 Hz, but removing them increased output by 10 dB at 32 Hz while considerably reducing port noise.

The AE 307 center speaker had exceptionally smooth response directly on-axis. However, the response notch at 3.5 kHz evident in the graph got worse at wider radiating angles. The AE 300c surround also had a response notch near its crossover frequency (4 kHz) that became significant at angles greater than 30° .

Bass limits for the AE 308 subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL) from the subwoofer. Output fell sharply below 32 Hz, but the sub produced 95 dB SPL at 25 Hz. The crossover points closely matched the frequencies marked on the dial, but there was a drop in level of 8 dB over the control's rotation, which means you'll have to adjust the volume during setup. — Tom Nounsaine



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Where A/V Meets PC



Sony's New Vaio PC Does It All

by David Ranada

At \$2,800, the least expensive Vaio PC in Sony's MX desktop line doesn't seem like much of a bargain these days, even for a 1.7-GHz, Pentium 4 with an 80-gigabyte (GB) hard drive, 512 megabytes (MB) of memory, the exciting "home" version of Windows XP, and two better-than-average speakers (the 15-inch Sony LCD monitor shown is \$600 extra). But the PCV-MXS10 that I tested — the various MX models differ only in the bundled home-office software — is much more than just a powerful PC. Of course, it does all the usual computer stuff like word processing, Web browsing, receiving streaming media, and editing digital photos (a task eased for Sony cameras by a Memory Stick

slot). But using only the built-in hardware and the supplied software, the MXS10 can also serve many other roles, such as that of a **personal video recorder**.

Sony's Giga Pocket software, together with the PC's internal 130-channel stereo TV tuner and ample hard drive (up to 60 GB of which is available for video data), enables the MXS10 to provide many of the functions of a TiVo or ReplayTV hard-disk video recorder. These include timer recording at three quality levels, which correspond to degrees of data compression; playback of a point earlier in the program currently being recorded (using Slip Play) or of a previously recorded program; and recording non-copy-protected composite- or S-video

signals from an external source. There's an Internet-based program guide that can be used for point-and-click recording setup, and you can watch your recordings either on the computer's monitor or on a TV via the MXS10's interlaced NTSC-video outputs. Many of the Giga Pocket functions are accessible through the supplied infrared remote.

Surpassing all standalone hard-disk recorders in versatility, Giga Pocket and the MXS10 also let you, for instance, edit out all the commercials from a recorded program, but your editing needn't stop there (more on this below). You can permanently store the edited results on disc using the built-in **DVD recorder**, a combination

DVD-R/RW drive that's the computer's only optical-disc drive.

You can "burn" edited video programs or homemade video productions onto write-once DVD-Rs that can be played on most standalone players. You can make "practice" discs by recording first onto rewritable DVD-RW blanks and then duplicate your fine-tuned production, as many times as you like, using the much cheaper DVD-R blanks. If you limit your productions to around 7 minutes — all home movies should be edited down to 7 minutes anyway — you can even record in DVD format on dirt-cheap CD-Rs that will play in many computer DVD-ROM drives (but not in standalone players).

The video productions you make, from either Giga Pocket recordings or imported MiniDV camcorder footage, can be edited and processed with a degree of sophistication unsurpassed — and probably unsurpassable — by any standalone DVD recorder because the software tools provided can turn this Vaio PC into a powerful **video editing system**. Besides Giga Pocket and Microsoft's Windows Movie Maker (part of Windows XP), three more video-editing programs are supplied, some of them easier to use — yet more powerful — than a standalone DVD recorder's editing features: Adobe Premiere LE and Sony's own MovieShaker and DVgate. The Adobe program has near professional-grade power, giving you fine-grain control over such things as scene transitions and overlapping multiple images as well as assemble and insert editing. MovieShaker is a fun and easy to use assemble-edit system, and DVgate is good for importing MiniDV footage as well as assemble-editing.

Like most PCs containing a DVD-ROM or DVD-R/RW drive, the Vaio MXS10 can be turned into a **DVD player** by using a software package. Sony supplies for this purpose its own strangely named Media Bar as well as Microsoft's Windows Media Player. Media Bar gives you the option of viewing the DVD in progressive-scan format on the computer monitor or on a TV via a composite- or S-video output. It also sends Dolby Digital data through the computer's optical digital audio output for external multichannel decoding. While there are no other surround sound facilities provided with the PC, if you listen through headphones via the front-panel jack, Me-

dia Bar can also perform Dolby Headphone virtual surround processing.

Aside from the latter two features, the MXS10 is basically a stereo device, as in the **FM radio** controlled by Sony's SonicStage Premium software, which allows timer recording of FM broadcasts to the hard-disk drive (with a bizarre time limit of 2½ hours per event).

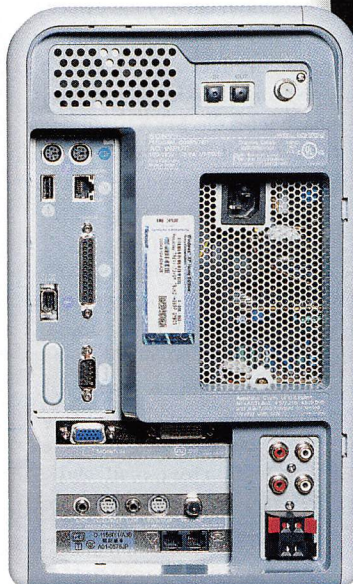
External analog or non-copy-protected optical digital audio sources can also be recorded. All audio recordings, including any tracks that you've ripped from CDs using any of three different supplied programs (more on that below), can be incorporated into a

music jukebox. SonicStage is, in fact, primarily a jukebox with inputs for FM, external analog or digital audio, CD, and, believe it or not, MiniDisc. Yes, using SonicStage, the MXS10 can also be turned into a **MiniDisc (MD) recorder/player** — there's a built-in MD drive.

Tracks ripped from CD can be "checked out" using SonicStage's OpenMG music-security system to an MD at any of three data rates. Two are MD-LP (long-play) rates using advanced ATRAC-3 data compression, and the third uses the MD format's original ATRAC-1 compression so the results are compatible with earlier standalone MD devices.

If you'd prefer not to use MiniDisc (still the most cost-effective way of carrying around large amounts of data-compressed music), you can also burn your own CDs using the

The back of the MXS10 contains only some of the connectors — the rest are behind a slide-down front-panel door.



The speaker-level outputs were nearly as clean as the line outputs (–71-dB noise levels) but clipped at 10 watts (10 dBW) into 8-ohm loads and 16 watts (12 dBW) into 4-ohm loads. While these figures fall short of Sony's "20-watt" rating, our results are in tough, real, standardized audio watts, as in our receiver measurements, not wimpy, nebulously defined "computer" watts. Besides, with closely positioned speakers as good as those supplied or better, even 10 watts can produce a very loud volume.

If you want even more audio power than the MXS10 can deliver, along with *really* clean sound, you should use its optical digital audio output, which was bit-accurate for 16-bit audio as long as the relevant volume control (the Wave or Compact Disc slider, depending on the player program being used) in the software output mixer was turned all the way up. This output is also the only way to get multichannel Dolby Digital DVD soundtracks from the MXS10.

The composite- and S-video outputs were very good when the PC was playing DVDs, with the luminance frequency response flat through most of the range and down only 3.6 dB at the DVD limit of 6.75 MHz (onscreen resolution was a full 540 lines). Setup level measured only +5 IRE (instead of the standard +7.5 IRE), but you can easily compensate for this small error if you calibrate your monitor using a DVD test disc. Onscreen letterboxing through the video outputs was poor — as it is on most of the DVD players we test. In contrast, progressive-scan image quality on a computer monitor was superbly smooth and free of artifacts. — D.R.



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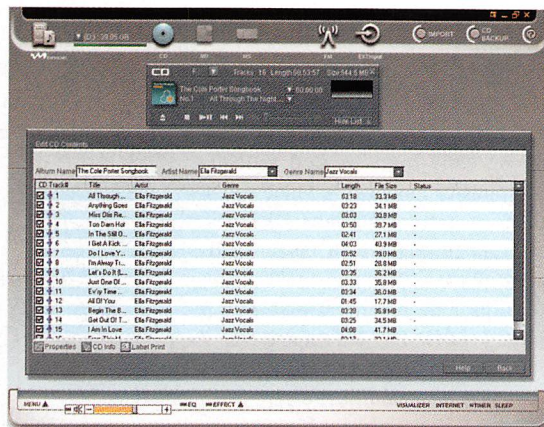
DVD-R/RW drive as a **CD recorder**. In fact, you can burn audio and data CDs using several different supplied programs. The only major piece missing that would make CD recording as sophisticated as DVD burning is a high-quality audio editing program — but I was able to install both Sonic Foundry's Sound Forge 5.0 and Syntrillium's CoolEdit2000 without a hitch.

If you wanted to purchase all these functions in separate hardware and software components — plus a computer — the total would probably add up to much more than the price of the Vaio MXS10. Such is the synergy provided by combining the power of a late-model PC and the storage capacity of an 80-GB hard disk with the capabilities of specialized hardware features (like the MiniDisc drive and the TV and FM tuners) and a diverse suite of bundled software.

And it all works! Timer video recording using Giga Pocket operated precisely as advertised — I was able to watch the first part of the recent PBS documentary on Mark Twain even as I was recording the second part. While Giga Pocket really eats up disk space when recording in its HQ (highest-quality) mode, its SP (medium-quality) and sometimes even LP (long-play) modes were adequate for time-shifting TV programs, if not for permanent storage on DVD.

I got the same thrills as I did in my high school filmmaking course editing MiniDV footage into something quite presentable (and of very high video quality) and just as big a kick out of burning the final production onto DVD for distribution to friends. But this only became relatively easy once I figured out how the various video capture and editing programs interacted — none of the manuals gives much guidance on this.

What we have with the MXS10, in fact, is an embarrassment of riches. While Giga Pocket and SonicStage are unique in their TV recording and MiniDisc support, respectively, the other supplied programs offer at least two completely different ways to perform many of the major operations enabled by all the hardware. In the case of video editing, as we've seen, *five* different programs are supplied, but we aren't told which is better for which application (video archiving, DVD burning, Web page creation, video compression for e-mail, and so on). Adobe Premiere LE is by far the most



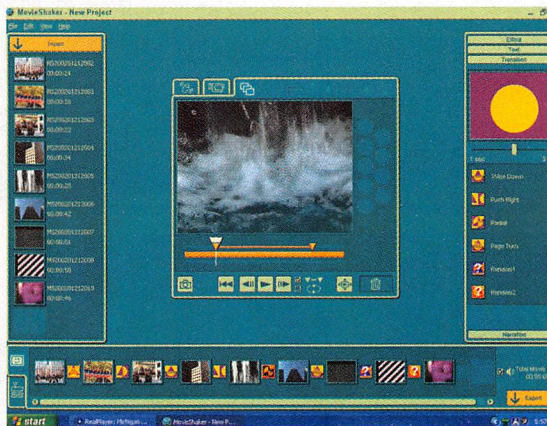
SonicStage Premium lets you record to MiniDisc from CDs in the DVD drive, from the built-in FM radio, or from external digital or analog sources.

versatile of these editing programs, but it's also the hardest to use and it won't, by itself, burn DVDs. How to get your Premiere-edited video into either of the two DVD burners provided, Sonic Solution's DVDIt! and Giga Pocket, is left as an exercise for the user.

When it comes to ripping CDs to a music library on the hard drive, you can use either RealJukebox, Windows Media Player, or SonicStage Premium — and there are definite audible ramifications to your choice. The most versatile in terms of trading off capacity for sound quality is SonicStage, as it provides the widest choice of ripping formats — MP3, Windows Media Audio (WMA), WAV, and ATRAC-3 — as well as a far wider range of data rates for the first two than RealJukebox or Windows Media Player offer. (Windows Media Player won't even let you make a bit-perfect copy of CD audio — everything is turned into compressed WMA files.)

Even something as simple as playing a movie on a store-bought DVD can be performed in two ways with different results depending on whether you use Windows Media Player or Sony's Media Bar. Only the latter provides a multichannel Dolby Digital bitstream output, and it's one of only two programs on the MXS10 that can turn on its external composite- and S-video outputs (Giga Pocket is the other). But Media Bar *doesn't* have the slow-motion, frame-stepping, and multispeed-scan capabilities of Windows Media Player. Then again, the PC's remote control operates DVD playback functions only when you're using Media Bar.

Regardless of the DVD player program used, the progressive-scan picture looked superb on both the Sony LCD monitor and on a traditional tube monitor. Once I adjusted each monitor's own picture controls with DVD test patterns, the fine details in the darkest areas of the image in the Can-



Sony's MovieShaker is the easiest to use of the five video editing programs supplied with the Vaio MXS10.

Can scene of *Moulin Rouge* became visible — like the texture in the men's top hats and tails. The picture took on a stunning depth and richness, as it did in other scenes of this visually amazing movie.

SonicStage has some quirks, like that 2½-hour limit on a timer-activated FM recording, and the slight gaps it added between contiguous CD tracks ripped to MD using the original MiniDisc format (the two MD-LP long-play modes produced no such gaps) or ripped to hard disk in the WMA and MP3 formats.

But SonicStage's most surprising quirk is that it totally ignores Internet radio — and the same is true of the other Sony-authored software supplied with the Vaio. Sure, you can listen to streaming audio, or watch streaming video, when you happen across it, using Apple's QuickTime, RealPlayer, or Windows Media Player, but none of the supplied software will let you *record* any streaming audio or video signals, which could be extremely useful. Fortunately, this can be done for audio, at least, with third-party software like Total Recorder from highcriteria.com. Using this, I was able to record 132-kbps RealAudio Webcasts of the Metropolitan Opera with *much* better sound quality (wider dynamic range, lower distortion) than is provided over the air here in New York City by WQXR-FM.

On the other hand, I was pleased to find a couple of useful features I *wasn't* expecting, since they aren't mentioned in the documentation. For example, both Windows Media Player and Media Bar were able to access and play the secondary Dolby Digital soundtracks on DVD-Audio discs. And considering the machinations you have to go through to transfer music to or from an MD using SonicStage, it was an ironic surprise to find that this same program was able to rip the music from the CD-compatible layer of a hybrid Super Audio CD — which some record companies are favoring

over DVD-Audio for its supposedly greater security!

I was also surprised to find that ultimately I grew to like the MXS10. Every new PC takes some getting used to, but this one seemed to take just a little longer. There ought to be a guidebook, with flowcharts, showing how to move video data files from one program to another, including the respective picture-quality tradeoffs. But after about a month of regular use, you'll get the hang of

it, as I did, and be able to do things like quickly dump DV footage from a camcorder onto the hard disk, edit it, and burn it to a DVD-R.

In the end, I found the Vaio MXS10 quite irresistible for its enormous versatility combined with its ability to keep the quality of A/V signals extremely high. The DVDs I made from edited DV camcorder footage were absolutely or very nearly identical to the originals, depending on the image content and provided I used the highest MPEG-2 encoding bit rate the programs allowed (8 megabits per second).

I also appreciated being able to have a massive music library ripped to hard disk using the ATRAC-3 codec (provided by RealJukebox and SonicStage), which to my ears gives results noticeably superior (much more like "CD quality") to both MP3 and WMA at equivalent bit rates. While the system is limited in its upgrade potential (there's only one free card slot and one free drive bay), the hardware capabilities are great enough that I don't think I'd be *ready* for an upgrade anytime soon aside from adding even more hard-disk space.

You could get most of the features of the Vaio MXS10 by upgrading a non-Sony PC (all except its MiniDisc and Memory Stick capabilities), but that would require very careful shopping for add-in circuit boards and more than a little expertise in software installation to make sure that whatever you add will work properly with the other hardware and software. The primary advantage of the MX series is that the wide range of capabilities provided not only work together but can work synergistically in ways limited only by your own imagination. With its enormous expertise in the three essential fields of computers, digital audio, and digital video, Sony is one of the few companies in the world that could have pulled this off.

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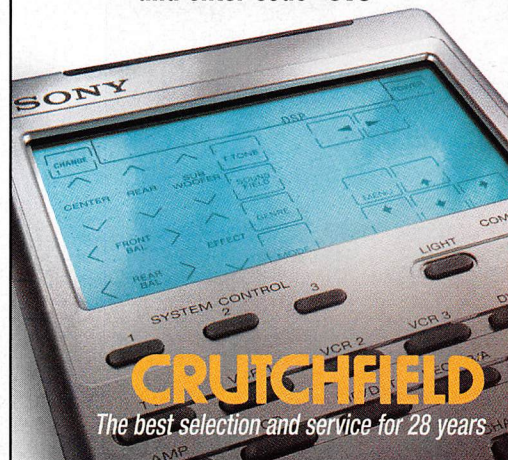
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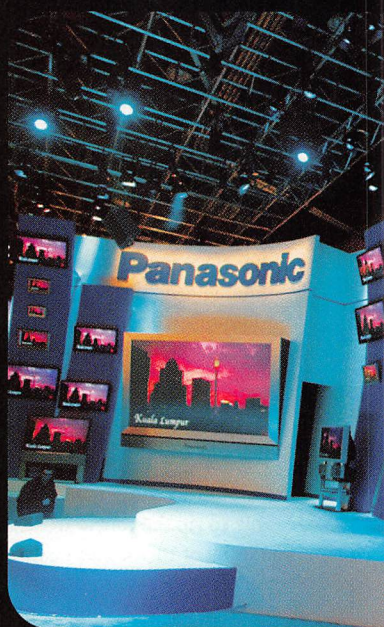
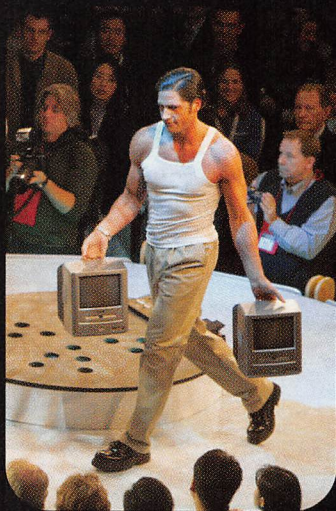
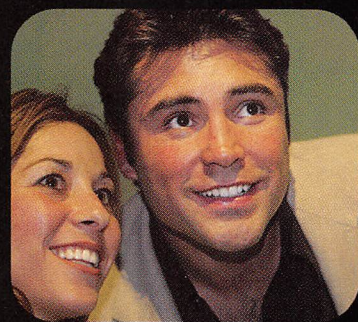
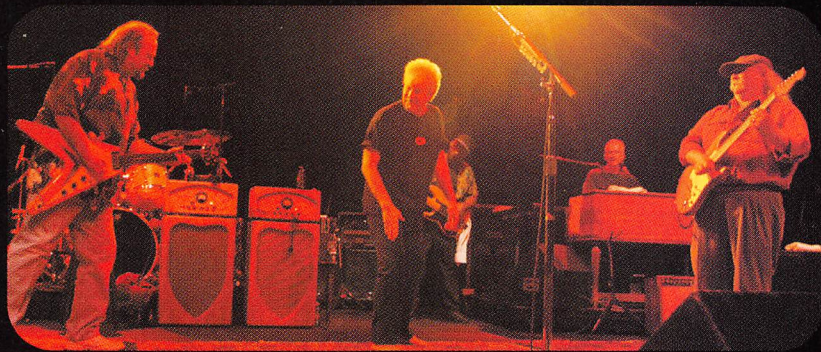
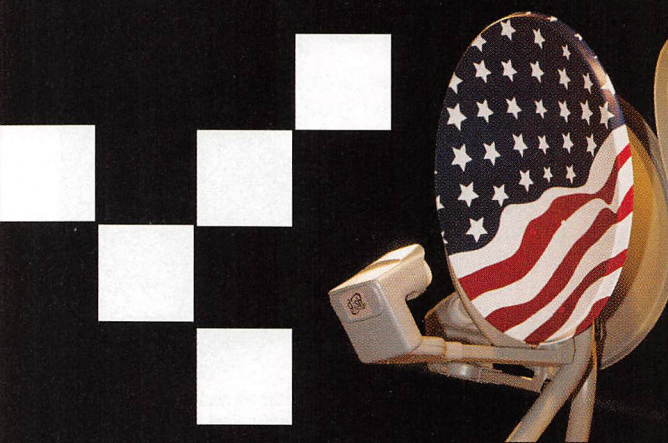
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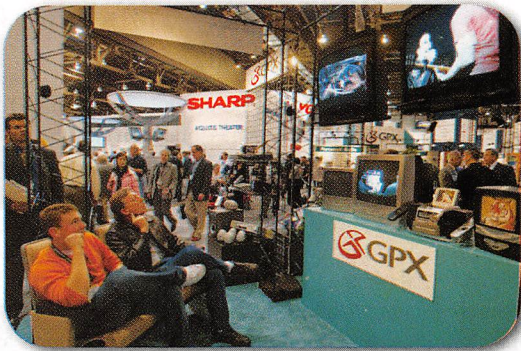


CES SHOWSTOPPERS 2002

Convergence took the lead at this



year's Consumer Electronics Show



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D-RAM DVD-R



Nobody's likely to remember 2001 as "the year the consumer-electronics industry saved Christmas," but it did just that. Without the surprisingly strong sales of DVD players and big-screen TVs, this past holiday would have been a disaster, sending ripples through the economy well into 2002.

Of course, it's not like the big CE guys exactly saw that holiday salvation coming, and the relative lack of big parties and earthshaking announcements at this year's Consumer Electronics Show reflected their caution. But the Christmas windfall did help buoy the mood of what could have been a very downbeat show, and it also helped encourage more than 100,000 people to come and check things out.

This year's products were mostly evolutionary, not revolutionary. TVs are getting not just bigger but slimmer, and audio components are taking on more computerlike traits, while personal computers are working their way toward your living room. Look for the trends of the past few years to continue in 2002: more and more sophisticated gear getting less and less expensive and, hopefully, more and more user friendly. Convergence, anyone? — *Michael Gaughn*

VIDEO by Al Griffin

When you combine the huge variety of products on display at CES with the normal distractions of Las Vegas, you might forget why you're attending the show in the first place. But somewhere between the combination cell phone/MP3 player/digital cameras and the porn star fortuitously encountered in an elevator lies your area of special interest, and for me that was video.

To judge from this year's CES, there's lots going on in the video world. Plasma TV is slowly moving from rich-guy conversation piece to mainstream product, and more manufacturers are building digital tuners into their high-definition TV (HDTV) sets. The ever-popular DVD category has

branched off into new forms, including combi players with built-in hard drives and standalone DVD recorders from a growing number of companies. And then there's a new breed of small, light, and Internet-savvy camcorders that make even MiniDV cams seem quaint.

While the signals on the HDTV front were generally positive at CES, manufacturers beat a curious retreat from last year's war cry of "more programming" to show on their large, boxy rear-projection sets. This year, lingering programming issues were sidestepped as makers showcased a bounty of slick TVs that ooze form factor — specifically thin, flat (and, yes, pricey) plasma and LCD models. ➤

SHOW PHOTOS BY TERRY SCHMITT

Gargantuan widescreen plasma TVs measuring between 60 and 63 inches (diagonal) were on display at the Fujitsu, Panasonic, Zenith, Samsung, Marantz, and Runco booths. At \$20,000 and up, these extra-large flat-screen sets are mostly destined for the home theaters of the rich and famous. Fortunately, other options abounded, including HDTV-capable 42-inch widescreen TVs for ten grand and under from Fujitsu, Hitachi, and RCA and enhanced-definition sets like Fujitsu's attractively priced PDS-4233 (\$5,999, available now).

Plasma TVs used to be industrial-grade products better suited to a corporate lobby than a plush living room, but to judge from the models on display from companies like Pioneer, Hitachi, Runco, Philips, and Sharp, the era of utilitarian plasma is over. Many of these sets now come with standard TV features like speakers and picture-in-picture plus cable-ready NTSC tuners built into an external box that also handles the audio/video ins and outs and neatly connects to the panel via a single cable. (For more information, and a shopping guide, see "Everybody Loves Plasma," page 94.)

Long-time liquid-crystal-display (LCD) advocate Sharp has been promoting its Aquos flat-panel LCD TVs in the 13- to 15-inch range for the past couple of years, and now it looks like more companies are getting on that train. I also encountered flat-panel LCD sets from Panasonic, Samsung, Philips, and Zenith. These pint-size monitors are targeted at people seeking a compact TV for the kitchen, bedroom, or office, but each manufacturer also seemed to be testing the size limits of LCD.

The prize for the biggest panel goes to Samsung, which showed a prototype 40-inch widescreen model (price: \$10,000). Sharp displayed its attention-grabbing 30-inch widescreen LC-30HV2U (price to be determined, due in March), while Zenith had its L30W26 (\$6,000), another widescreen 30-incher that's due out later this year. These panels are compatible with high-def sources and can also double as a computer monitor.

Other, less Jetsons-like, HDTV-set options were also on view, including Digital Light Processing (DLP) and LCD rear-projection TVs (RPTVs) and a number of

models that rely on tried-and-true cathode-ray-tube (CRT) technology. From a design standpoint, the most striking HDTVs were Panasonic's slim and light 40-inch PT-40LC12 and 45-inch PT-45LC12 widescreen LCD rear-projection sets (\$3,499 and \$3,999, respectively, due this spring). A 43-inch Samsung model in the Texas Instruments booth showcased TI's latest-generation 16:9 DLP chip. Samsung says that both the 43-incher and its 50-inch big brother will be available this summer at \$3,999 and \$4,999, respectively.

Another trend was more HDTV sets with built-in tuners for decoding off-air high-def broadcasts. Zenith had the widescreen 34-inch C34W23 (\$2,499) and two 4:3 models, the 32-inch C32V23 (\$1,500) and the 36-inch C36V23 (\$1,999). All three sets should be available by June. Thomson announced an RCA Scenium 61-inch widescreen rear-projection CRT model, the HD61W140 (price and availability to be determined). In addition to receiving and decoding digital TV broadcasts, the set has numerous multimedia-friendly features, including a Windows CE-based op-

VIDEO SHOWSTOPPERS



CAMCORDER BREAKTHROUGHS (from left): Hitachi's DZ-MV2070A (\$1,299) records on 3-inch DVD-R and DVD-RAM discs, Panasonic's SV-AV10 (\$450) stores video on SD memory cards, and Sony's DCR-IP7BT (\$1,700) records on the new, matchbox-size MicroDV cassettes.



Toshiba's RD-2000 DVD recorder has a built-in 40-GB hard drive (left, \$799).

Panasonic's 40-inch PT-40LC12 LCD rear-projection HDTV is only 15½ inches deep (right, \$3,499).



erating system, an Ethernet port, and both DVI (Digital Visual Interface) and FireWire (IEEE 1394) connections, making it compatible with both types of interface slated to appear on the forthcoming digital cable and satellite decoders.

A few set-top HDTV tuners grabbed my attention. Samsung's SIR-TS160 DirecTV/HDTV receiver (\$699, due this summer) offers 1080i- and 720p-format output and features both wideband component-video and DVI connections. JVC showed a prototype TU-9000 Dish Network/HDTV receiver (also slated for summer release), which includes wideband component-video and DVI outputs as well as a FireWire port that allows you to record high-def programs using JVC's HM-DH30000U D-VHS recorder (\$1,995).

There were few details available on the prototype satellite receivers announced by Dish Network, which included a combination receiver and hard-disk recorder capable of storing high-def programs. Anticipating the pending merger between DirecTV and EchoStar, which owns Dish Network (awaiting regulatory approval), Dish also announced a receiver that handles transmissions from both services when hooked up to a three-LNB antenna.

The big HDTV news was DirecTV's announcement of an added high-def channel — without saying what the channel would carry. Also, Thomson announced it would sponsor Superbowl XXXVI in Fox Wide-screen, as Fox network calls its widescreen 480p (progressive) format digital broadcasts. That was a shocker given Thomson's aggressive promotion of true 1080i-format high-definition broadcasting in the past.

Previews of recorders that use a blue laser to record high-def video on DVD-size discs have become a staple of CES, but this year the prototypes appeared to be only a couple steps away from real products. Engineers from Pioneer, Samsung, Toshiba, Hitachi, Panasonic, and Zenith were on hand to talk about their recorders. Zenith's model uses a single lens for recording both high-def on high-density media and standard-def programs on regular DVD-R discs. The recorder, due out in 2003, also features a built-in HDTV tuner

and a FireWire port. Panasonic, meanwhile, trumped the competition by demonstrating a recorder capable of storing up to 4 hours of high-def video on a 50-gigabyte (GB) dual-layer disc.

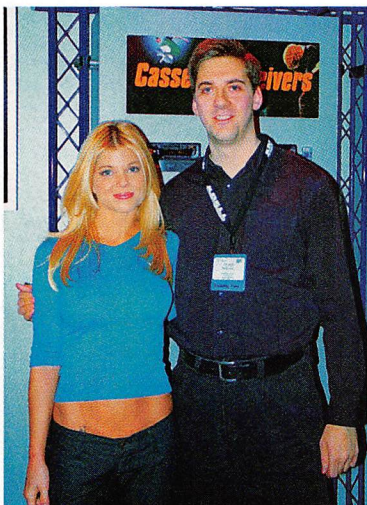
Manufacturers pushed the DVD-combi envelope at CES 2002. Samsung unveiled one of the more intriguing components, the DVD-H40 progressive-scan DVD player with a built-in 40-GB hard-disk drive for time-shifting TV programs (\$799, expected this fall). The company also highlighted a trio of progressive-scan home players (from \$250 to \$350) and one portable (\$1,300) that include slots for Sony's Memory Stick removable media. The slot allows you to transfer A/V files from portable Memory Stick devices like a digital camcorder, camera, or Discman and view or listen to them on your system. Samsung planned to have the players available by April or May.

With a TiVo-type interface, a 40-GB hard drive, and a built-in DVD recorder, Toshiba's RD-2000 (\$799) will be the ultimate machine for video archiv-

ing when it comes to market later this year. Also at Toshiba's booth were a number of DVD players that can handle both MP3 and Windows Media Audio (WMA) files burned onto recordable CDs (see "Audio," page 80, for more on WMA).

Virtually every DVD player manufacturer showed a progressive-scan model in the \$200 price range. A quick survey of the show floor found Zenith to be price king: its single-tray DVB216 will list for a mere \$160 when it hits stores in April.

Three new camcorders from Hitachi that record on 3-inch DVD-R and DVD-RAM discs — the DZ-MV270A (\$1,300) and the DZ-MV230A (\$1,000), due in April, and the DZ-MV200A (\$900), due in June — combine the compact size of Mini-DV with the convenient playback associated with VHS. The cams record up to 30



S&V's Pete Pachal puts the squeeze on *Baywatch* babe Donna D'Errico.

Radio Road Show

Until recently, it looked like Sirius satellite radio was going to take the high road, eschewing commercials, raucous program-

ming, and gaudy promotions so it could look down its nose at its more bumptious country cousin, XM. But with the recent arrival of new CEO Joe Clayton, Sirius seems to be working hard to create more of a carnival atmosphere around the service —

literally. Sirius unveiled a scale model of a Ferris wheel with eight vintage cars that it hopes to cart around to the parking lots of electronics stores so the curious can take a ride to check out its programming. Since XM already had over 27,000 subscribers nationwide as of early February, the yet-to-launch Sirius has some catching up to do. So any PR, no matter how corny, can only help. The service planned to begin rolling out in February and add regions until it's available nationwide by the end of the year.

Given the new competition from Sirius, you'd have thought XM chief Hugh Panero (below left) would've wanted to talk about



surging subscriber numbers or expanding hardware support

or all the positive reviews his service has been getting during our half-hour chat at CES. Instead, he wanted to discuss writer Gene Newman's comment that Panero was as "cool as Lee Marvin" when he met him at XM's Washington offices ("XM Rated," February/March). Doing some digging, Panero was less than thrilled to find out that Marvin was something of a booze hound and a

wife abuser. I guess it's a sign that a business is doing well when the CEO has time to do his own damage control.

— M.G.

Left, Jensen's mockup for a Sirius radio boombox.



minutes of video in high-quality mode on blank DVD-R discs, which can then be played in most DVD players and DVD-ROM drives. They also function as digital still cameras. The two lower-priced models have a USB 1.1 interface, while the DZ-MV270A supports the new USB 2.0 standard, which transfers data up to 40 times faster than its predecessor.

Sony shook things up with the introduc-

tion of a new camcorder tape format, MicroMV. The cassettes are 70% smaller than MiniDV tapes yet provide the same 60 minutes of high-quality video recording. Downsizing is made possible by MPEG-2 compression, which can squeeze the same footage into half the space that DV-format video eats up. The line of cigarette-pack-size, 1-pound cams includes the DCR-IP5 (\$1,300) and DCR-IP7BT (\$1,700), both

currently available. The DCR-IP7BT also offers Bluetooth technology for wireless file transfers, e-mail, and Web browsing via the cam's LCD screen.

And Panasonic introduced a palm-sized SD memory-card-based camcorder that's as much a music player and camera as anything else — which is why you'll find it described in more detail under "Convergence," starting on page 82.

AUDIO by Michael Gaughn

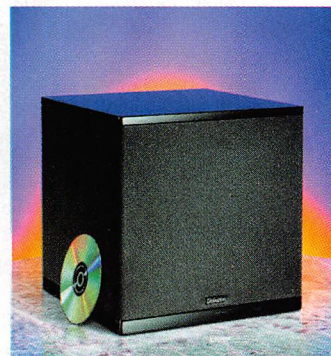
As Al Griffin's report makes clear, new technologies are causing the avuncular, potbellied tube TV to morph into a sleek, flat-panel symbol of the new digital age. While not as widely heralded, the same is true for traditional audio components. Loading up on hard-disk drives, microprocessors, and other digital goodies, things like receivers and recorders are becoming more Borg-like with each passing year.

This trend has been most obvious with hard-disk-based music servers, which become more powerful and sophisticated with every generation. Something of a novelty just a year or so ago, these boxes now seem poised to become staple items in any serious home-entertainment system — and why not? They allow you to store your entire CD (and MP3 and anything else) collection on a single drive, offer album and track access so fast it'll make your megachanger seem like it's filled with goo, can easily be hooked up to the Internet for grabbing music files and album info, more often than not use a TV interface, and can let you play different tunes in different rooms at the same time off the same drive.

Some of the latest servers, including Onkyo's MB-S1 (\$800), SonicBlue's Rio HSX-109 (\$1,500), and the Imerge S1000 (\$1,500), were featured at the GraceNote



Clockwise from top left: NHT's mix-and-match Evolution line, Jamo's A 410PDD lifestyle speakers, the ultra-compact SuperCube II subwoofer from Definitive Technology, and Ellula Sounds' inflatable beer-can speakers.



booth. GraceNote supplies the online interface for many Internet-savvy devices, including the Philips Streamium MC-i200 streaming-audio boombox (\$399, due this summer). The Streamium provides stand-alone access to streaming-audio content,

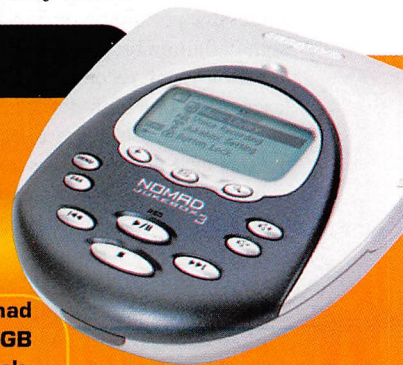
such as Web radio stations, using a broadband connection. Looking ahead to the day when buying downloadable tracks and albums from major artists will be commonplace, it also lets you create personal playlists in an online jukebox.

AUDIO SHOWSTOPPERS



Its slim design allows Outlaw Audio's IR 1000 broadband Internet radio tuner (\$299) to fit in with traditional audio components.

The Creative Labs Nomad Jukebox 3 (\$399) features a 20-GB hard drive, a 20-hour battery pack, and USB and FireWire ports.



Outlaw Audio's IR 1000 Internet radio tuner (\$299, due this spring) also lets you run a broadband connection directly into the box, rather than by way of your computer, to receive streamed content from the Net. Unlike the Streamium, though, the Outlaw has the slim profile of a traditional tuner so it can slip in easily among your other components.

Of course, all of this convergence stuff started with hard-disk portable players like the Creative Labs Nomad Jukebox. The latest version, the Jukebox 3 (\$399, due this spring), more than triples the disc capacity (from 6 to 20 GB) of the original model, uses a battery system said to allow 20 hours of playback, and includes both FireWire and USB ports for fast file transfers from your computer. And it crams all that into a sturdy shell about 30% smaller than your average Discman. The hard drive's generous storage capacity also lets you transport video, photo, and text files as well as listen to music. Other debuts in the handheld hard-disk category are SonicBlue's Rio Riot (\$400, due in March), which also features a 20-GB drive and includes a large LCD readout and an FM tuner, and RCA's new Lyra Personal Jukebox (\$299, scheduled for spring), which has a 10-GB drive.

The car is becoming a more audiophile-friendly environment if the demos from THX, Dolby, and Lexicon are any indication. THX unveiled its Ultra Premium Car Audio program for certifying car components, while Dolby teamed up with BMW, Alpine, MB Quart, and others to demonstrate Pro Logic II in the car. Pro Logic II, which can create convincing surround sound from just about any two-channel source, is particularly well suited for spicing up tapes, CDs, radio, or anything else you're listening to on the road. Lexicon also hitched a ride with BMW to show off its impressive Logic 7 surround system.



The Philips Streamium MC-i200 streaming-audio boombox (\$399) works directly from a broadband Internet connection.

Dude, Where's My DVD-Audio?



Last year's DVD Entertainment Group (DEG) reception was a DVD-Audio love fest. After listening to a series of celebrity testimonials to the new format's potential, every attendee was sent home with a shopping bag full of discs to check out. At this year's reception, *Monsters Inc.* directors Lee Unkrich and Pete Docter (above) were given 20 minutes to talk about how they grew up loving laserdisc, while DVD-Audio got 5 minutes, if that. DEG spokeswoman Amy Jo Donner followed Warner Home Video president Warren Lieberfarb's justly celebratory recitation of last year's DVD-Video sales figures with an almost apologetic listing of how many DVD-Audio titles have been released (125), how many titles will be released this year (225 to 240), and how many manufacturers are supporting the format (10) with how many players (40). Absent was any word on how the discs are selling or how the format is being promoted, and this year's attendees went home empty handed.

Things were considerably more upbeat at the Super Audio CD (SACD) press conference, where representatives from Sony, Philips, Tower Records, and the world's largest recording company, Universal Music Group, took the stage to show their support for the format. The biggest

news was Universal's plans to release an ambitious slate of SACDs this year, including well-known albums from Shelby Lynne, Diana Krall, Steely Dan, Muddy Waters, and others. SACD has almost 100 multichannel titles available, and the combined muscle of Sony Music, which owns the extensive Columbia Records catalog, and the Universal behemoth — with EMI poised to weigh in — presents a serious challenge to the DVD-Audio catalog, which is derived almost exclusively from the Warner Music labels.

And unlike DVD-Audio, SACD's supporters haven't been shy about letting people know about their format. Tower Records founder Russ Solomon, for instance, talked about the SACD listening kiosks that have been placed in Tower, Circuit City, Best Buy, and Tweeter stores around the country (see "Random Play," page 16). The best news of all, though, was that



the number of players that can handle DVD-Video, DVD-Audio, and SACD is expanding. The SACD booth (above) featured not only Pioneer's soon-to-be-available universal player but also prototypes from other mainstream companies like Onkyo, Yamaha, and Kenwood.

— M.G.

Another sign of these convergent times is the ascendance of Microsoft's Windows Media Audio (WMA) data-compression system. While MP3 might have caused the compressed-music revolution, the resulting anarchy scared the bejezus out of corporate types, who now want to make sure the technology is firmly under *their* control, not the user's. It's not surprising, then, that the lord of all corporations, Microsoft, should be aggressively positioning its WMA codec as the biggest and baddest of the MP3 killers. Panasonic, Pioneer, Toshi-

ba, and Samsung are all making sure that people know their products are WMA compatible, and it's likely that more major players will fall in line soon.

Panasonic showed a multichannel receiver, the SA-XR10 (\$599, currently available), that uses 1-bit technology to cram 500 watts of power into a chassis little bigger than a laptop computer. Given the proliferation of gotta-have home theater gear — and the continually increasing girth and heft of receivers in particular — any technology that can get them to slim down is welcome indeed.

But for those who need the comforting sight of a really big, really heavy black box to know that all's well with the world, there were some new flagship receivers that made every effort to cram everything you could think of into one chassis. Denon's massive THX Ultra 2-certified AVR-5803 (\$4,300, due in March) delivers 170 watts of power to each of its seven channels, while Yamaha's RX-Z1 (\$2,799, slated for April) sends 130 watts to each of the six main channels and 45 watts to each of two front-effects channels.

You'd think speakers would be immune from all these high-tech trends. For years, with their variously sized rectangular enclosures and familiar cloth grilles, they've been the one constant in an audio world gone mad with change. No longer. The more intriguing speakers at CES all found different ways to break out of the traditional particleboard box.

In a bold move, NHT scrapped its Music and Home Theater speaker lines and replaced them with the Evolution series — a mix-and-match set of eight models that can be configured for everything from a small bedroom to a full-blown home theater. The two multipurpose satellite models can be used on their own or coupled with one of three bases (two have built-in powered subwoofers) to create a complete system priced from \$2,230 to \$10,000 (due in April).

Unlike most speaker systems, Jamo's slim and silvery A 410PDD (\$1,400, available now) was designed with spousal acceptance in mind. The four satellites come with arcing aluminum stands for floor placement, but they can also be wall or ceiling mounted, or placed on a shelf. The center speaker and subwoofer have the same cool and sleek styling.

Maybe the most striking example of the trend toward smaller and more powerful

subwoofers is Definitive Technology's SuperCube II (\$899, due this spring), the anchor of its System 350 and System 450 for home theater. Boasting a 1,250-watt amplifier powering an 8-inch driver, the SuperCube II comes in an ultra-compact enclosure that's only 12 inches on a side.

If the idea of a wall-hanging speaker that looks like a black-velvet Elvis didn't do anything for you (those were actually available a few years ago), how about an inflatable speaker shaped like a beer can? It might sound too wacky to be true, but the plastic Budweiser-can speakers do exist, and they don't sound half bad, either. Developed using NXT technology, which allows things like car-door panels to be turned into speakers, the cans (from Ellula Sounds) use an "exciter" in the base to project sound up through the enclosure. U.S. distribution isn't set yet, but they sell in England for around \$90 a pair.

CONVERGENCE by Michael Antonoff

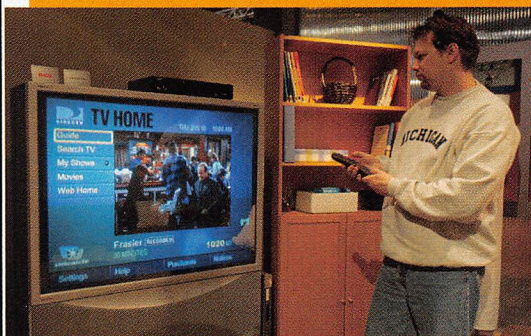
Convergence took on new prominence at CES 2002 as manufacturers target households that have both multiple TV sets (most of them) and computer networks (more and more of them). Bells are ringing for the emerging video-server category, in which a hard-disk-based component serves up TV programs, movies, and music to people in various rooms using a home network. Also gaining momentum is wireless networking, an easy way to retrofit a home.

Leading the server charge are TiVo, SonicBlue, Compaq, Pioneer, and a new company called Moxi Digital. The all-in-one Moxi Media Center combines the functions of a hard-disk recorder, like being able to pause a live broadcast or save every episode of *Alias*, with the capabilities of downloading songs from the Internet, playing DVDs, ripping CDs, and storing home videos and digital photos. Using small peripherals called Moxi Media Center Extensions, content stored on the Cen-

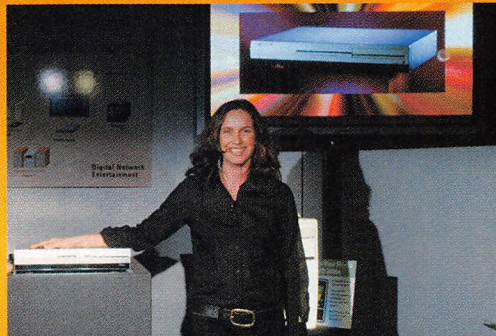
ter can be distributed over a wired or wireless network to up to four TVs throughout a house. Moxi is selling the Media Center through EchoStar, which plans to either lease or sell systems beginning late this year or early in 2003. An EchoStar representative said in February that the company hadn't yet decided what its combo receiver would cost or which of Moxi's various features it would include.

Compaq Computer showed a prototype server that can sit on a home theater rack

CONVERGENCE SHOWSTOPPERS



UltimateTV now lets you program your home TV instantly from anywhere in the world.



The Moxi Media Center (right) combines hard-disk video recording with Internet downloading and home-network distribution.

Pioneer's Digital Library (left) will store, play, and stream digital music, video, and photos throughout a home network.



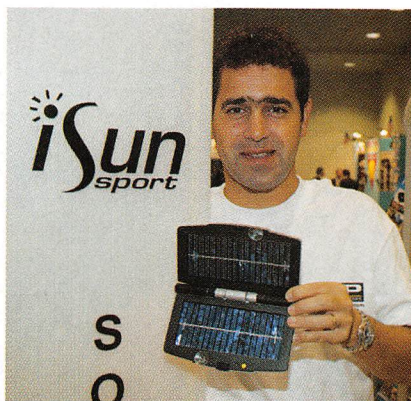
and be used to stream music, images, and video from a computer connected through a home network to big speakers and a TV. Rob Masterson, consumer marketing manager for Compaq, declared: "People want to look at their photos on a TV and listen to their music on their stereo." This from a computer guy.

Pioneer unveiled its Digital Library, a product that also stores, plays, and streams digital music, video clips, and photographs throughout a home network. The Library isn't expected until late this year, however, and pricing wasn't available.

Meanwhile, TiVo announced the Tivo Series2 with up to 60 hours of recording time. The recorders contain two USB ports for connecting a digital camera and an MP3 or CD player. The ports can also be used for new entertainment services such as digital music, digital photos, broadband video on demand, and video party games. A 40-hour version of the Series2 is already available from AT&T Broadband for \$299. TiVo expected to begin shipping the 60-hour version (\$399) in February. (The same \$10-a-month or \$250-for-life service fee applies as for previous TiVo models.) TiVo also announced that RealNetworks' RealOne Player will be integrated in the Series2 for creating and managing a music collection on the hard disk and for downloading or streaming music from the Internet.

Displayed at SonicBlue's booth were the next-generation ReplayTV 4000 hard-disk recorders (see page 64), which have been available on the company's Web site since early January. Unlike previous models, the ReplayTV 4000 recorders can be used for showing digital photographs, serving up recorded programs to other Model 4000s on a home network, and sharing programs with remote Model 4000 users via a broadband Internet connection.

Picking up on the theme of digital connectivity in the home, Microsoft chairman Bill Gates used his keynote address to introduce two prototypes in the company's eHome initiative. The first, using technologies code-named Mira and based on CE.Net, a Windows operating system optimized for Internet use, was demonstrated by an LCD-based tablet PC. Also called a media pad or a "thin client," it uses a wireless WiFi (a.k.a. the 802.11 wireless security standard) connection so you can use it anywhere in the house. A video clip showed a man deciding whether he wanted to read a newspaper or use a media pad with an active Internet connection to a news site. He eventually grabs the media pad and takes it into the bathroom.



From top: iSun solar-powered battery pack for portable devices (\$75), Icebox Flipscreen TV/DVD player/Web browser (\$2,999), and Essential Reality P5 videogame controller (\$149).



The other eHome technology, Freestyle, is a remote-control interface for entertainment-oriented PCs based on the new Windows XP operating system. It will allow you to operate a music or movie player on your computer from anywhere in the room. Companies expected to provide Freestyle products by the end of the year include NEC, Samsung, and Hewlett-Packard.

Demonstrating how the boundaries between computers and entertainment are becoming blurred, Gates at one point realized (or so he said) that he'd neglected to instruct his personal video recorder to save the *Monday Night Football* broadcast then in progress. No problem. Using a computer set up onstage, he simply logged onto a new UltimateTV Web site — available from any Internet connection in the world — and called up a program guide duplicat-

ing the one for the DirecTV satellite service. He highlighted the game and clicked record. Within seconds the command was downlinked to the UltimateTV receiver in his home, and it began recording the program. ReplayTV already lets you control its hard-disk recorders by logging onto MyReplayTV.com, but the record instruction isn't retrieved by the set-top box until it performs its daily guide download, which could be as much as a day later. UltimateTV's instant record-from-anywhere feature is expected to be available beginning in April at no additional charge beyond a DirecTV program package and a basic \$9.95-a-month UltimateTV subscription.

One example of a "thin client" combo for the home is the Flipscreen from Icebox. The TV/DVD player/Web browser can be attached under a kitchen cabinet, and the 12-inch LCD pivots or can be swiveled out of sight. The Flipscreen also has an input for a security camera so you can see who's at the front door. Including a touchscreen, FM radio, instant messaging, and WMA streaming, a CE.Net version will be sold later this year through custom installers for \$2,999.

In this new world where the only good A/V device is a digitally connected device, computer to TV and computer to stereo peripherals proliferated. Philips unveiled the Photo-eXpanium eXp601 portable photo viewer/MP3/CD player (\$199), which has a composite-video output for displaying digital photos on your TV. Simple Devices and Motorola introduced SimpleFi (\$379), a HomeRF wireless component designed to transmit computer audio at 2.4 GHz to a stereo with greater fidelity and range than 900-MHz devices. Both products are available now.

There seemed to be fewer flash-memory portable audio players introduced at this CES than at the last three shows. The category hasn't been helped by the continued format war between Secure Digital or SD, MemoryStick, CompactFlash, MultiMediaCard or MMC, SmartMedia, and the proprietary memory packs used by the latest Rio players.

Still, there were some new card players. Panasonic introduced a combo music player with voice recording as well as still and video camera capabilities. The video portion uses MPEG-4, a highly compressed format optimized for storing short clips in memory chips and transmitting video over the Internet. The palm-size SV-AV10 (\$450, shown on page 78) comes with a 64-MB SD card and was expected to be available in March under the e-wear name. ➤

GRAHAM NASH 5.1-Way Street



"I tend to get carried away with technology," admits Graham Nash, one-third of the sweet harmonic equation that comprises the signature sound of Crosby, Stills and Nash (and sometimes Young). Nash, 60, has just come offstage after a loose, jam-oriented soundcheck before CSN performs at

Monster Cable's VIP-only awards shindig here in Las Vegas. Right as he sits down at a table in the Grand Ballroom of the Mirage Hotel for an exclusive interview, Nash grins and notes, "I'm really excited about recording in 5.1." Teach your children, indeed. — Mike Mettler

The recent CSN and CSNY tours have been quite interesting, musically speaking. I think a lot of people didn't expect to hear new arrangements of a lot of your classic material...

That's right. And neither did we. [both laugh]

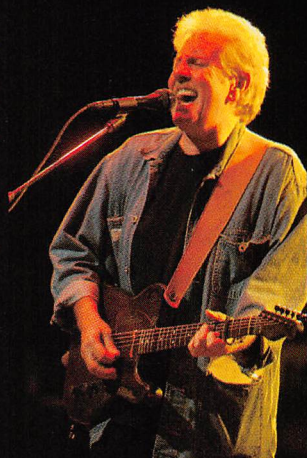
Last year, Herbie Hancock shared an interesting observation with us about how a performance is heard in the audience and how performers hear it onstage. For example, you've never heard yourself as the audience hears you, except on live recordings...

... And you've never heard how it sounds to us in the studio, recording in the middle of a band. That's one of the things I really love about 5.1-channel mixes. Finally, we're able to put you in the middle of the studio or in front of the band, right as we perform. I think that's a very interesting perspective.

What have you done in 5.1?

Several things. I did my new solo record, *Songs for Survivors*, in both stereo and 5.1, on the DTS label. And I've also done [1971's] *Songs for Beginners* in 5.1. I wish this technology had been available in the early '60s!

Did you find you had to rethink any of the original mixes from *Beginners*?



One thing I found was that we had to do the stereo mix first, and then the 5.1. If I tried to do the 5.1 mix of, say, "Chicago" first, I found that the subsequent stereo mix would *suck*, but only because it would sound confining and not as open as it does in 5.1.

What did you do with 5.1 on your new record?

I wanted to keep the heartbeat of the music as the central focus, which meant that the snare drum, the kick drum, and the bass are right in the middle. If [drummer] Russell Kunkel did a four-tom run, I'd use that in the middle, too. Background vocals were separate from the main vocal, but there's some part of everybody in the front three speakers. I've only "filled in" the surrounds. I'm not crazy about separating things just because I can, like putting the kick drum in the front speakers, the snare in the back, and the high-hat off to the left. I don't think that's the way music sounds naturally.

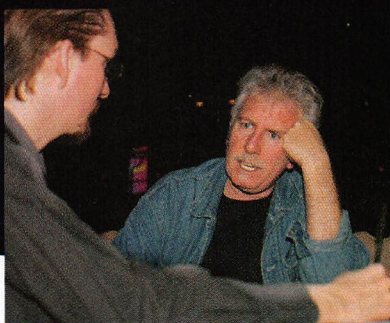
Has 5.1 caused you to rethink how you'll record other new material?

No, not yet. But it's made me rethink what I will do with older albums. I'd love to do [CSNY's

1970 studio album] *Déjà Vu* in 5.1. Now, a lot of people will be screaming, "It's in stereo, so it should remain in stereo!" But I want to find out what it sounds like to put you in the middle of us jamming at the end of "Carry On." Because of the limitations of only 19 or 20 minutes per side of a vinyl record in those days, we had to fade "Carry On," "Woodstock," and "Almost Cut My Hair" because of time considerations. But now, those time considerations don't exist. So I'd like to redo *Déjà Vu* from start to finish so that you can hear all 8½ minutes of "Almost Cut My Hair," from the moment [drummer] Dallas [Taylor] counts it off to when he puts his sticks down after we crumbled to an end.

This reminds me of what you had to do at the outset of [1971's live CSNY album] *4 Way Street*.

Exactly! "Suite: Judy Blue Eyes" had to start in the middle of a fade-in because we just didn't have the time available to put everything on the album. But I'm not sure that because you *can* put tons of songs on a CD you *should*. We've been trained to listen to 10 or 12 songs per album, and people get antsy after much more than that.



Samsung showed the YP-700H (\$229), scheduled to be available in early spring with 128 MB of built-in memory, a slot for a SmartMedia card, an FM tuner, voice recording, and a proprietary algorithm that the company claims doubles the compression of its supported codecs (MP3, WMA, and AAC) without any loss in sound quality. Luck Technology unveiled the SlimAudio player, a device as wide and long as a credit card and not much thicker. Embed-

ding a lithium-polymer battery and memory (from 16 to 256 MB), SlimAudio uses a compression technique called Bytero that claims "better-than-MP3 quality sound." A 64-MB version sells for about \$150.

Thomson Multimedia introduced a storage card inspired by single-use cameras. Though the Matrix Memory card fits in an MMC or SD slot, it's not technically flash memory since it can be written to only once. Prices hadn't been set for the card,

which will be sold under Thomson's Technicolor brand name, but a product manager said the cost of a 64-MB version would be equivalent to that of two rolls of film, or about \$10. That's a fraction of the cost of a reusable card.

It hasn't taken long for convergence to go from kludgy to cool. And this year's CES offerings suggest that cutting-edge electronics might be your best gift-giving bet for Christmas 2002 as well. **S&V**

"Like Strapping Yourself Onto a Rocket Sled and Lighting the Fuse"

— Darryl Wilkinson, *Home Theater Magazine*

Definitive Technology's BP2006TL wins "the highest praise any speaker system can garner...definitely Academy Award material"

— Rich Warren, *Sound & Vision Magazine*

The experts go wild over these amazing bipolar superspeakers!

Reviewers rave that never before has a speaker of this compact size and affordable price delivered such spectacular, superior and breathtakingly alive world-class sound quality. Bipolar technology makes all Definitive's BP Series loudspeakers (from \$299 to \$2250 ea.) sonically superior to any conventional speaker regardless of size or price. The dramatic sonic benefits of our revolutionary patented bipolar technology plus the BP2006TLs' awesome 250-watt built-in powered subwoofers (U.S. pat. #5,887,068) result in remarkably sleek and stylish loudspeakers which deliver the listening experience of a lifetime. They combine exceptionally refined musicality with thunderous bass power and lifelike room-filling three-dimensional imaging for your total listening pleasure. If you are looking for absolute "you-are-there" music and movie excitement in your home, you must experience Definitive's BP2006TL and all our speakers and complete matching home theater speaker systems today!

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ACCESS DENIED!



How the recording industry's new copy-protection schemes could keep you from your music

by Stephen A. Booth

If the major record labels have their way, that bright red "record" indicator on your CD burner or personal computer could eventually become as unresponsive as the long-wave band on a vintage AM radio. Some of the labels have already released music discs that prevent you from using your computer to make digital copies on either recordable CDs or the computer's hard drive. Some of the copy-protection technologies make it

difficult for you even to *play* a CD on a computer. And these discs also make it impossible for you to compress music on your PC for transfer to a portable MP3-type player.

As if that weren't bad enough, some of these "content management control" technologies won't let you make digital copies using a standalone CD recorder — even though you've already paid for the right to do so as part of the price of the recorder

and the blank discs. Even worse, the unpredictable nature of some copy-protection systems makes it impossible to guarantee that the protected discs will play in all home and mobile CD equipment (including DVD players).

Hits and Misses

As we reported last November in "Random Play," the record labels have been experimenting with five methods of copy protec-



Copy protection on RCA's European release of *White Lilies Island* by Natalie Imbruglia (above) made it unplayable in many conventional CD players, causing an uproar.

tion (see "Meet the Schemes" on page 90), including Cactus Data Shield (CDS) from Midbar Tech; key2audio, developed by Sony's CD manufacturing arm, Sony Digital Audio Disc Corporation (Sony DADC); and MediaCloQ from SunnComm. Macrovision, the company whose name is synonymous with video copy protection, offers a system called SafeAudio Version 3 (SAV3). A fifth, as yet unnamed, system hails from the labs of the International Federation of the Phonographic Industries (IFPI), the worldwide record-industry umbrella group that includes the Recording Industry Association of America (RIAA).

Some of the record labels' experiments have gone beyond the lab. Copy-protected CDs have been issued in Europe to an unsuspecting public with little or no warning on their packaging about possible playback

glitches in computer drives or in home and mobile audio gear.

(Even the record retailers were taken by surprise!) The most obvious public experiments — and foul-ups — have come from Germany's BMG, whose labels include RCA. The company upset a lot of people in Europe by using copy protection on its RCA releases there of Natalie Imbruglia's *White Lilies Island* and *Greatest Hits* by the Australian boy band Five.

The European RCA discs used Midbar's CDS protection, which is meant to foil PC copying. But it was the complications it caused with other audio gear that provoked the uproar. Many people thought their hardware was on the fritz only to learn that unadvertised copy protection was responsible for their playback woes. Depending

on the hardware, the problems have included outright rejection of the disc, random track skipping, and an inability to play certain tracks. Apparently in response to the firestorm it created, the label has since rereleased both discs sans copy protection.

More recently, Universal Music Group used CDS for its first copy-protected U.S. title, *More Fast and Furious* (a sequel to the soundtrack of the movie *The Fast and the Furious*). But unlike BMG, Universal openly acknowledged the copy protection

on both the packaging and an insert card, stating that the disc might be incompatible with some CD players. The label also instructed its retailers to accept any disc returns and to give refunds to anyone who had problems.

It's not known how many discs have been released with copy protection worldwide. Macrovision

claims that the major labels have sold millions of discs that use SAV3 with no complaints about compatibility. SAV3 is one of the more flexible and liberal systems since only computer copying is prevented. Sony DADC says 10 million discs comprising 500 albums have been released with its key2audio system, which prevents PC playback or copying. It, too, claims that complaints have been negligible. Yet key2audio might be responsible for the troubles I and others experienced with last summer's *Celebrity* from 'N Sync, released by Zomba Records (see "Hands-On with Rogue Discs," page 92). That CD appeared in British, American, and European versions, each containing a different number



Dissent from Within

It's not surprising if CD-player manufacturers object to copy-protection systems that cause playback problems with their products. But even some in the record industry take umbrage at systems that introduce hardware incompatibilities. The brouhaha over Natalie Imbruglia's *White Lilies Island* and similar copy-protected discs caused one industry veteran to express his disenchantment with the labels' shortsighted goals.

"Unfortunately, I fear that the commercial trials that music companies have implemented so far, as well as

those that I am aware of being launched soon, appear to do more harm than good to the important cause of consumer-friendly CD copy management," said Sami Valkonen at a seminar sponsored by the International Recording Media Association in New York. At the time, he was BMG's senior VP for new media and business development. Valkonen bemoaned "old school" copy-protection methods that "lock out" music and degrade sound on computers. He said the music industry was "shooting itself in the foot" by introducing "premature

solutions" that cause playback incompatibility.

At BMG, Valkonen had been a proponent of SunnComm's MediaCloQ copy management, which lets disc buyers transfer music to their computers and even portable digital players after receiving authorization online from the copyright holder (see "Meet the Schemes"). Although the music files are tied to one person's devices and can't be transferred, MediaCloQ gives music fans flexible and liberal use of the recordings they've purchased. — S.B.

Congress Takes on the RIAA

January 4 was not a good-hair day at the Washington headquarters of the Recording Industry Association of America (RIAA). That's when its president and CEO, Hilary Rosen (below), received a scorching query from Rep. Rick Boucher

(D-VA, right) about the music labels' plans to add copy-protection technology to CDs.

Boucher, who co-chairs the House Internet Caucus on technology matters, suggested that copy protection violates the Audio Home Recording Act

(AHRA) of 1992, which "clearly requires content owners to code their material appropriately to implement a basic compromise: in return for the receipt of royalties on compliant recorders and media, copyright owners may not preclude consumers from making a first-generation, digital-to-digital copy of an album on a compliant device using royalty-paid media."

Among other questions, Boucher

asked the RIAA what steps are being pursued to ensure that sound quality isn't degraded by copy protection and that the usefulness of consumer audio equipment isn't compromised. He also asked if the record companies would support independent testing of copy-protection technologies before they're introduced and if so, would they "provide assurances" that they wouldn't turn around and claim that the testing or peer review of the tests violates the Digital Millennium Copyright Act (which criminalizes any attempt to circumvent copy-protection systems).

Without responding to all points of Boucher's inquiry, Rosen was quick to justify the use of copy protection while assuring us that CD sound quality wouldn't be impaired.

"Copy protection is certainly not new to the entertainment industry," she said. "Most movies and videogames sold today have some form of protection. It is not surprising, therefore, that companies in the recording industry are taking steps to get 'in tune' with the rest of the entertainment field.

"In fact, many music and technology companies are already testing alterna-

tive forms of copy protection," Rosen continued, "that they hope will offer the right balance between preventing wholesale copying and uploading to the Internet while still allowing some copying onto hard drives or CD-Rs for personal use. Fans may rest assured that these companies' first priority will remain the listening experience. As an industry, we are fully committed to ensuring the same, if not higher, audio quality and to providing consumers with the same conveniences they have enjoyed in the past."

Of course, the recording industry has made similar promises about sound quality and copy protection before. Just ask *Sound & Vision* technical editor David Ranada, who played an influential role in preventing the record labels from foisting inferior-sounding CopyCode-protected recordings on the public almost two decades ago. The only thing clear about the current copy-protection mess is that it's far from over.

— S.B.

of tracks and using varying degrees of an unidentified copy-protection scheme believed by many experienced observers to be key2audio.

Rights and Wrongs

Rather than unleash a barrage of copy-protected titles here in the U.S. and face a series of stiff legal challenges, the major labels have chosen to fight the early skirmishes in Europe. As of early February, Universal's *More Fast and Furious* was the only copy-protected CD released in the U.S. with full disclosure of possible playback problems.

The labels chose Europe as the target for these draconian measures because CDs are

much more expensive there, providing an extra incentive for people to make multiple copies on inexpensive computer burners and blank discs. And unlike the U.S., European countries have no legal mechanism in place that authorizes consumers to make digital copies in exchange for a royalty.

Here in America we have the 1992 Audio Home Recording Act (AHRA). In this compromise between the electronics and music industries, Congress levied a royalty payment on stand-alone digital-audio

recorders and blank media. The royalty, which is included in the purchase price of the products, goes to compensate content owners and artists for the copies buyers are presumed to make.

Although it's easy enough to use a CD-ROM drive to copy a CD onto a hard-disk drive, computers were not included in the AHRA because Congress deemed them to have "substantial non-infringing uses" under copyright law, such as backing up data. Few in 1992 could have foreseen how the emergence of Internet file sharing and data-compression schemes such as MP3 would encourage many



"Superstar" from Saliva (left) is the featured track on *More Fast and Furious*, the only copy-protected CD released in the U.S. so far that carries a full disclosure of possible playback problems.



JOSEPH COUTICE/ISLAND

people to use their computers to make cheap, royalty-free copies of CDs. Fewer still could have envisioned the impact all of that copying would have on the recording industry's worldwide sales and revenue. Not surprisingly, the personal computer is now the main target for copy-prevention systems.

Profit and Loss

It's an unfortunate consequence of the recording industry's efforts to clamp down on computer-based copying that people are now having playback problems with

dedicated audio gear. Given that some CD players are 20 years old, it's difficult for the inventors of copy-protection schemes to know exactly how their systems will interact with the many different kinds of equipment out there. And there may even be problems with *newer* gear. In an effort to save money by not having to make two kinds of drives, manufacturers are increasingly using CD-ROM drives, rather than dedicated CD-audio drives, in their CD players. And since many DVD-Video players use DVD-ROM drives, similar problems are likely to crop up there. Electron-



One of the releases that provoked an outcry in Europe over copy protection.

Meet the Schemes

Some copy-protection developers will tell you *what* their systems do, but all of them remain tight-lipped on *how* they do it. Technical explanations can sometimes be found in patent documents, but these might be incomplete or obscure. Here's what's currently known about the five systems being used by the major record labels.

SafeAudio There are two different approaches to copy protection: main-channel and control-channel. "Main-channel systems alter the way the audio data are recorded on the disc," explains Peter Newman, VP of engineering for Macrovision Europe. "Control-channel systems alter the data in the subcode channels, which are used for steering and error recovery. SafeAudio is a main-channel system."

SafeAudio, which Macrovision codeveloped with TTR Technologies, introduces deliberate errors into both the audio data and the error-correction codes in the main channel. The protected CD can still play on a computer or CD player, which interpolate data to bridge the gaps using electronic guesswork, but the errors spoil the sound on any copy.

Macrovision contends that main-channel protection poses less of a risk of incompatibility than control-channel protection, which prevents a disc from playing at all in some existing players. But critics say that the necessary interpolations could have an audible effect because the player is constantly guessing at the corrupted data.

"Not so," insists Newman. "The un-

correctable errors are so carefully sited, with such similar information on either side of the gap, that there is an accurate way to bridge the gap. The bridging is so tiny, so narrow, and so perfect that the human ear can't detect it."

Macrovision claims that SafeAudio discs will play on virtually all CD audio equipment and has opened its lab to demonstrate its ambitious compatibility-testing program. No other copy-protection developer has done so or even revealed how it tests for compatibility.

Cactus Data Shield (CDS)

Midbar Tech has patents for control-channel protection, which it might or might not be using as part of various technologies employed on CDS-protected discs. The company won't explain its technologies, but every Cactus disc released so far prevents computers from playing the standard audio tracks on a CD by denying access to the disc's Table of Contents.

In compensation, CDS-protected discs automatically install a software player from EverAd on the computer that lets users play a version of the album as a compressed music file. When you hold a Cactus-encoded disc's play surface to the light at the correct angle, you can actually see two data areas, separated by a clear band where no data are written. The inner band is standard audio, supposedly playable on all standalone CD equipment; the outer band is the compressed music file.

The CDS system uses either a 32- or 44.1-kHz sampling rate at a 80- or 128-kilobits-per-second data transfer rate for its compressed files, compared with the CD standard's 44.1-kHz sampling and 1.4-megabits-per-second data transfer. Midbar recently claimed that all known

Copy-protection system	Play CD in computer drive?	Copy to hard-disk drive?	Copy from CD to audio CD-R?
Cactus Data Shield	yes ¹	no	possibly
IFPI	yes	no	not known
key2audio	yes ²	no ²	not known
MediaCloQ	yes ²	no ²	no
SafeAudio	yes	no	yes

¹ Discs install CDS music player software on computers for playback of compressed version of music from the discs. ² Discs permit storing one digital copy on the computer when access is granted online by the content owner.

What the different copy-protection schemes will let you do — or not do — with a CD you've purchased varies by brand, and even within a single system. That's because each system is actually a cocktail of technologies that content owners can mix according to taste. Generally speaking, the more restrictive the final recipe, the greater the chance of playback incompatibilities and other problems with hardware. The table above outlines what we know about the capabilities of the five contending systems. (Some information is still being withheld by the inventors, who continue to tinker.) There might be other copy-protection schemes lurking that have yet to be identified.

ics manufacturers predict that before too long almost all optical-disc players will use ROM-type drives.

Hardware manufacturers are concerned that the spoiler codes in copy-protected discs, which are designed either to foil CD playback in ROM drives or to ruin CD copies made from them, will overwhelm the error-correction circuitry in CD players or cause them to interpolate so much missing data that the sound will become distorted. Since there are no published specifications for any of the copy-protection systems, manufacturers of CD equipment

have no way of knowing whether a copy-protected disc will work in one of their players or what effect any given system will have on the player's performance if the disc does play.

The electronics industry's concerns over playability and recordability have gotten the attention of at least one high-ranking member of Congress. Just before January's Consumer Electronics Show and the formal debut of key2audio and SAV3 at a major music-industry gathering in France, the RIAA and IFPI received a scorching inquiry from Rep. Dick Boucher (D-VA),

co-chair of the House Internet Caucus on technology matters. He suggested that CD copy protection violates the Audio Home Recording Act (see "Congress Takes On the RIAA," page 89).

But there's some question whether the AHRA gives U.S. consumers the "right" to make digital copies even if they've paid a royalty. Some copyright attorneys contend that the act guarantees only that consumers can't be prosecuted for copying — and thus doesn't prohibit content owners from implementing ways to prevent them from doing so. And the labels might be able to

playback problems with standalone players had been resolved in the latest version of CDS, Cactus Data Shield 200.

key2audio The key2audio system, from Sony Digital Audio Disc Corporation (Sony DADC), prevents you from playing a protected disc on a computer, although a recently announced option, key2audio4PC, would let disc buyers download a version that's locked to their specific machine. A nine-digit serial code on the disc unlocks access to the online files for downloading. You can copy the files to a blank CD — but that disc is then playable only on the computer where the copy was made. If you send the files to another computer via the Internet, the recipient can't play them. And if someone else gets access to the key code, he can't download the files because the Web server knows they've already been downloaded.

According to Sony DADC, the music on key2audio discs is purely standard CD audio with none of the built-in uncorrectable errors typical of main-channel protection schemes. It also claims that key2audio discs will play "on nearly all hardware dedicated to playing audio CDs," including home, mobile, and DVD players and videogame consoles. But the company won't say if "nearly all" includes standalone CD recorders.

Although Sony DADC won't detail how the key2audio system works, patents reveal that it uses a variety of methods. These include control-channel protection that modifies the timing data in the Q-subcode, which prevents computer drives from reading the disc. The altered data also provides the key needed to unlock the downloadable key2audio4PC files.

The patents also suggest that

key2audio uses the Serial Copy Management System (SCMS) employed by standalone CD recorders, and an executive at Sony DADC confirmed this. The presence of an SCMS "flag" indicating (falsely) that an original disc is a first-generation digital copy explains why you can't make a digital copy of a key2audio title — like 'N Sync's *Celebrity* — on a standalone recorder (see "Hands-On with Rogue Discs").

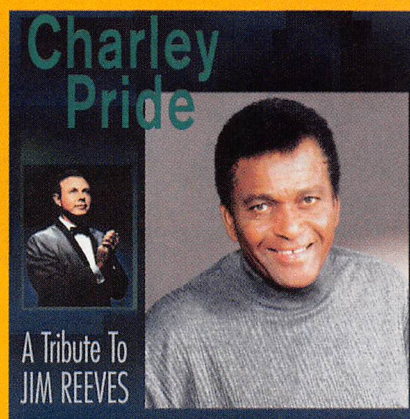
The company recommends that key2audio licensees "inform record buyers about the use of copy protection." But despite the company's claim to have shipped 10 million key2audio discs in Europe, no such advisory has been reported except for the European release of *Celebrity*, which didn't identify the type of copy protection used.

MediaCloQ Patents haven't yet been published for SunnComm's MediaCloQ, so it's hard to say exactly how it works, but computer access works similarly to key2audioPC. The disc itself won't play in a computer, but it carries a unique identifier that allows the buyer to download a version for playback on the registered machine. At the discretion of the content owner, transfer of the file to a single portable device is also possible — but the file can't be transmitted beyond that.

SunnComm claims perfect compatibility with standard CD players, and so far no one has claimed to have any trouble with the single MediaCloQ release to date: Charley Pride's *A Tribute To Jim Reeves* (Fahrenheit). But that disc, the first known to be issued in the U.S. with copy protection but without a specific warning that it won't play in PCs, is subject to a lawsuit in California. The complainant argues that she wasn't

adequately informed that the disc wouldn't play in computers (the disclaimer merely said that the disc would play only in CD and DVD players) and that MediaCloQ's online registration requirements violate her right to privacy.

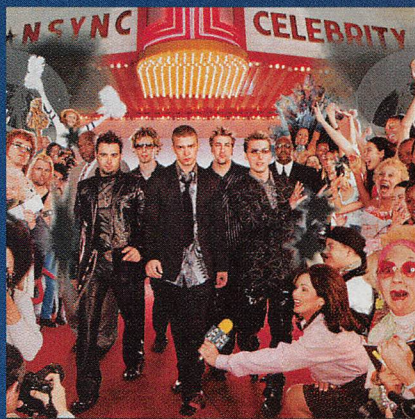
IFPI This system might never see the light of day, sources at the London-based International Federation of the Phonographic Industries (IFPI) say, for several reasons conceded in the patent. The system uses control-channel protection to upset a disc's timing



codes. The patent asserts that the protected discs would work "in the majority of audio CD players" but would disrupt computer copying. However, the system "also prevents legitimate usage such as the importation of data into portable players developed under the SDMI," or Secure Digital Music Initiative, which was founded under the IFPI's auspices. The patent is also frank in admitting that the system would prevent music playback on "high-quality systems such as the Meridian 800 Reference DVD/CD Player." — S.B.

Hands-On with Rogue Discs

The only thing that can be said with certainty about copy-protected discs is that you really can't be sure how compatible any of those released to date will be with any given machine. And the rogue disc of rogue discs has proved to be 'N Sync's *Celebrity* — the label that released it, Zomba Records, won't even reveal which *kind* of copy protection is being used.



The jacket of the European version carries a small-print message that the disc can't be played in a computer drive — and it can't. That's consistent with the system developed by Sony's Digital Audio Disc Corporation (Sony DADC), key2audio, which can stop computer playback and, therefore, ripping to hard drives, burning onto CD-R/RWs, transferring to portables, and transmitting to the Internet. There's no such

warning on the American and British versions, which play in computer drives just fine. What's troubling about these versions is their bizarre behavior in various standalone audio players and recorders.

With the Serial Copy Management System (SCMS), you should be able to make any number of digital copies one by one from the original using a standalone recorder and blank discs on which you've paid a royalty. But the European pressing of *Celebrity* wouldn't play or record in a Philips CDR765 or CDR870 recorder and TDK's DA-3826 recorder, and it wouldn't record on Sony's MDS-JE500 MiniDisc deck.

With the same disc, Harman Kardon's 4x-speed CDR20 recorder automatically reverted to analog copying at regular speed. But SCMS-compliant recorders are supposed to revert to analog only when they detect a code on the disc in the source drive that indicates it is already a digital copy. The recorder, finding the SCMS flag that Sony DADC deliberately inserted on the *original* disc of *Celebrity*, assumed that it was a digital copy and refused to record it digitally. That's one way to implement copy protection, if an unorthodox one, and there could be more than one way used on *Celebrity*.

Things got stranger still. After rejecting the European disc several times over a period of days, the TDK deck eventually recognized it as an audio CD and began analog real-time

dubbing. The same occurred with the U.S. pressing of *Celebrity* in the Philips CDR765. Meanwhile, the U.S. disc played and copied instantly and digitally in the Harman Kardon and TDK decks and in an RCA CDRW121 recorder. We checked to make sure that the SCMS detection was working fine in each recorder, and it was. (The U.K. disc exhibited the fewest playback problems, for reasons that remain unknown.)

Zomba Records had no explanation for the *Celebrity* discs' chameleonlike behavior in some recorders. Neither did Sony DADC, whose Salzburg, Austria, plant pressed the British and European discs, nor Sonopress, which made the American one. Regardless, it's obvious that these discs aren't kosher by the standards set down in the Philips Red Book specification for audio CDs. The Dutch electronics giant, which codeveloped the CD format with Sony and administers the patent licensing, has stated that a disc that introduces incompatibilities and otherwise fails to adhere to Red Book standards can't legally be called a "Digital Audio Compact Disc" and can't carry the familiar, trademarked logo.

Philips has yet to back that judgment by going to court, but one record label has already taken evasive action. Search BMG's Cactus-protected European version of Natalie Imbruglia's *White Lilies Island* for the CD logo, and you won't find it, because it's not there. — S.B.

cite 1998's Digital Millennium Copyright Act (DMCA), which criminalizes any attempt to circumvent copy-protection systems as a precedent for that interpretation. This disturbs Boucher, who is preparing legislation to expand consumers' fair-use rights to digital content. Meanwhile, lawyers for the Home Recording Rights Coalition (HRRRC) point out that the existing law gives manufacturers the right to make products that evade CD copy protection if it prevents legitimate playback of the discs that use it.

In a statement to the Congress and Administration, the HRRRC said it "believes that any encoding of CDs that interferes with consumer recording rights preserved by the AHRA would constitute a violation of that law. Moreover, technologies that

would make signals nonstandard should not be considered protected by the Digital Millennium Copyright Act of 1998."

It appears that CD copy protection is at least headed for debate — if not oversight — by the federal government. Boucher has asked the recording industry whether it will permit independent listening tests of the various systems — a move Macrovision has said it will seriously consider.

This wouldn't be the first time that the government has weighed in on sound-quality issues. Back when most music listeners made copies on analog cassettes, the RIAA proposed that the CBS CopyCode system be included in all recorders and recorded audio media. The proposal was squelched by the government when tests done by *Sound & Vision's* predecessor, *Stereo Re-*

view, revealed that the CopyCode system audibly degraded the music.

As computers and portable compressed-audio players become ever more popular ways to listen to music, and as hard-disk-based music servers begin to proliferate, the issues raised by copy protection will undoubtedly become even thornier. But at the moment, any resolution seems as far away as ever. **S&V**

Stephen A. Booth regularly covers software copy-protection and related technical and legal issues as senior editor of the industry newsletters *Television Digest*, *Audio Week*, and *Consumer Electronics Daily*.



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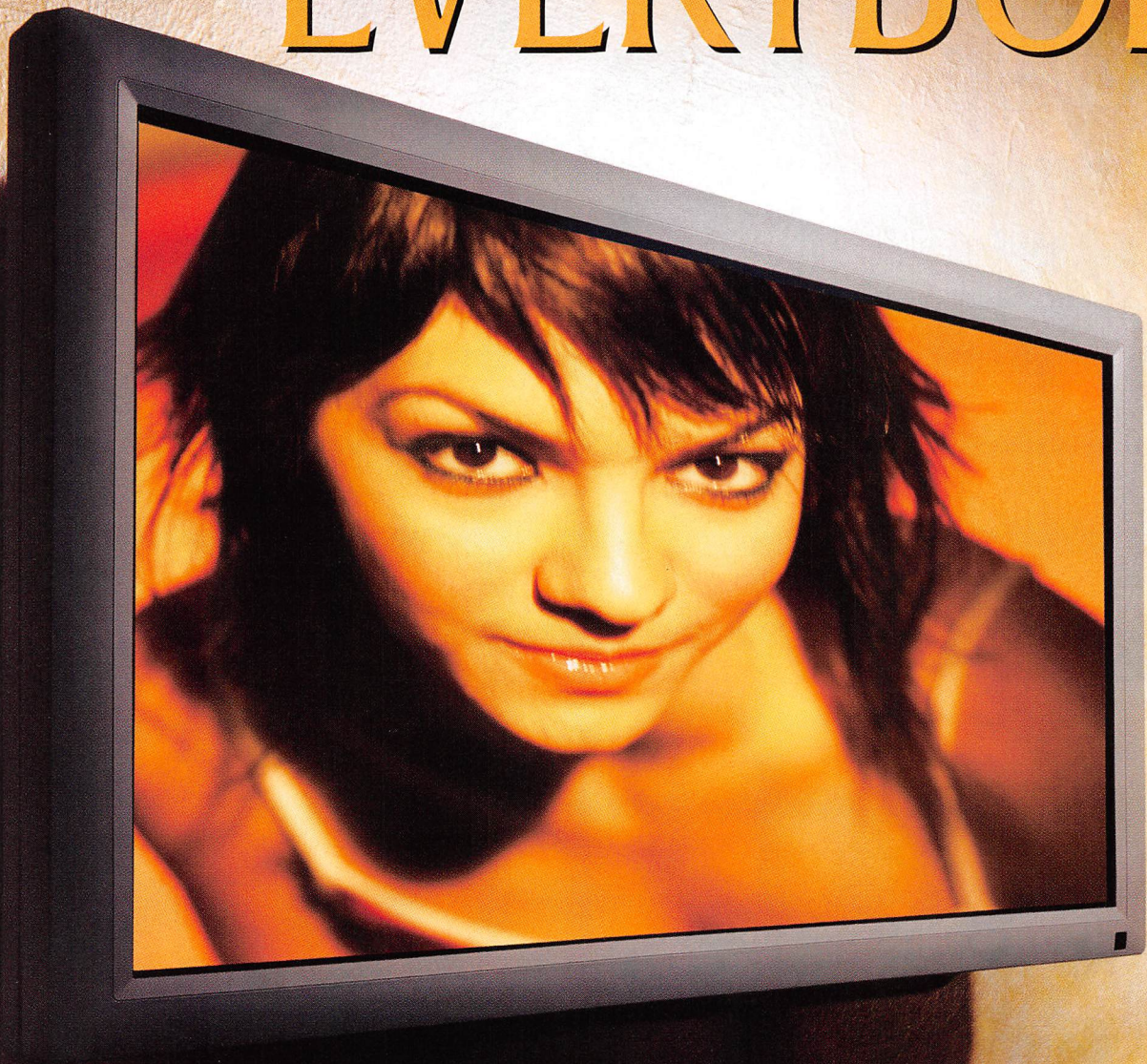
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EVERYBODY



LOVES PLASMA

The inside story on those sleek, sexy — and pricey — TVs ♦ by David Katzmaier

Ever since that Philips commercial where a European-looking couple try hanging their thin TV in every room of a minimalist apartment, finally settling for a spot on the ceiling above the bed, plasma sets have been creating a stir. From airports to movie theaters to corporate boardrooms, these slimmed-down big-screen TVs draw stares from almost everybody. Unfortunately, hardly anybody can afford one.

A plasma TV typically costs more than two big-screen rear-projection HDTVs. But things *have* come a long way since 1997, when the first 42-inch plasma displays sold for \$15,000. Today's sets produce much sharper images and start at about \$6,000. At this rate, it'll still be awhile before the average American can hang a plasma set on the wall without taking out a second mortgage, though nearly everybody who sees one in action would love to take it home.

Gas Works

The idea of using plasma gas to produce an image has been around since before those Euro-looking actors were even born. And flat-panel TVs have been on everybody's wish list since they came to symbolize the home of the future back in the 1950s. Plasma panels were co-invented by University of Illinois professors Don Bitzer and Gene Slottow in 1964. Bitzer assigned one of his promising students, Larry Weber, to study the tiny gas-filled chambers, or cells, at the heart of the panel. Companies like IBM soon recognized the potential of the technology and began their own research.

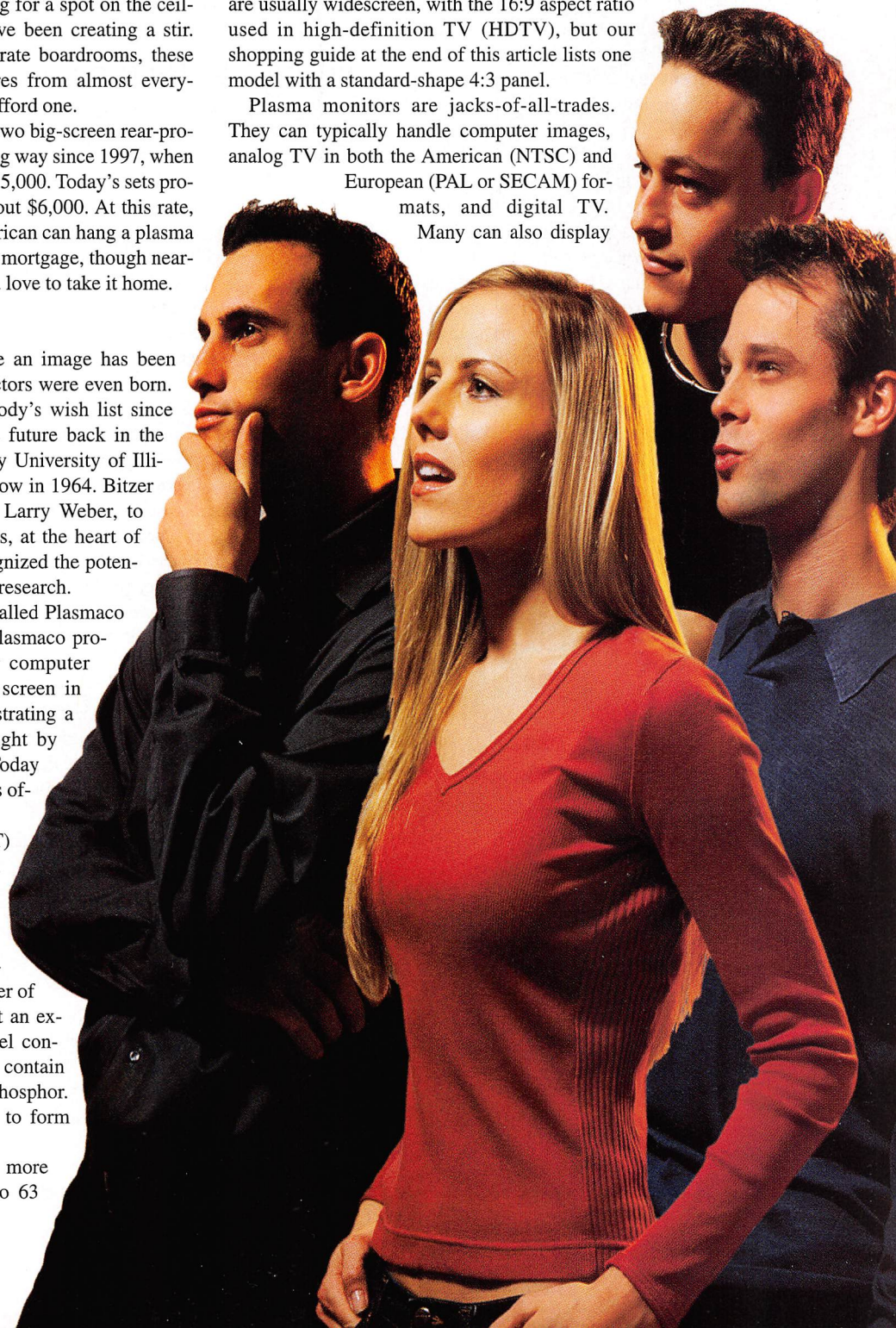
Weber eventually founded a company called Plasmaco to develop and market plasma displays. Plasmaco produced 10-inch monochrome screens for computer makers in 1989, followed by a 21-inch screen in 1991. Five years later, soon after demonstrating a working color panel, Plasmaco was bought by Panasonic's parent company, Matsushita. Today Panasonic is one of numerous major brands offering plasma display panels.

Unlike traditional cathode-ray tube (CRT) technology, which uses an electron beam to excite the colored phosphors that produce an image, plasma panels rely on ultraviolet light emitted by highly ionized gas to activate the phosphors. In this plasma state, the gas has a roughly equal number of positive ions and free electrons, making it an excellent conductor of electricity. Each panel consists of a few million tiny glass cells that contain the gas along with a red, green, or blue phosphor. Three cells, one for each color, combine to form one *pixel*, or picture element.

A single panel can contain a million or more pixels, and screen sizes range from 32 to 63

inches (diagonal). Smaller sizes are feasible, and manufacturers are also experimenting with displays up to 72 inches. Plasma TVs are usually widescreen, with the 16:9 aspect ratio used in high-definition TV (HDTV), but our shopping guide at the end of this article lists one model with a standard-shape 4:3 panel.

Plasma monitors are jacks-of-all-trades. They can typically handle computer images, analog TV in both the American (NTSC) and European (PAL or SECAM) formats, and digital TV. Many can also display



high-definition programs. Only a few have built-in TV tuners (although that's changing) or sound systems. The major advantage of plasma over a traditional picture tube, aside from its superiority as a status symbol, is size. A large-screen CRT set needs a deep cabinet to house its electron gun. The average 36-inch TV is about 2 feet from front to back and weighs more than 200 pounds (try hanging *that* on your wall). A plasma monitor, thanks to those self-contained imaging cells, is only a few inches deep regardless of its screen size. Most 42-inch plasma sets are around 3½ inches thin and weigh less than 70 pounds. And plasma TVs can have significantly larger screens than CRT-based direct-view sets, which are limited to a maximum of 40 inches or so.

Indeed, plasma might be the ideal display technology for home theater. Unlike projection setups, front or rear, which you have to watch in a dim room, plasma TVs look fine over a wide viewing angle in normal room lighting. Their slimness makes installation a matter of clearing enough wall space. Custom installations can involve a plasma screen centered above a mantelpiece or sliding down from the ceiling — one inventive design mounts the display inside a transparent glass wall that swivels between two rooms.

Those of us in lower tax brackets are more likely to run into plasma screens in public places or to see them used on TV shows. America's first large-scale commercial application of high-definition plasma displays was at the New York Stock Exchange, which installed panels above the main trading floor to display trades and quotes. Airports are a significant market for the panels, which can be hung just about anywhere to display arrival and departure information as well as eye-catching advertisements ("digital signage") that can be changed in an instant or on an automated schedule.

Getting the Picture

Plasma image quality has come a long way since the first panels were introduced, but experts generally agree that video on plasma screens still doesn't look as good as on the best tube-based high-definition TVs. "Today's plasma displays are seriously better than they were two years ago, but there are still some issues," explains video consultant Joe Kane, co-founder of the Imaging Science Foundation and producer of the forthcoming calibration DVD *Digital Video Essentials*.

"The major problem," he says, "is lack of resolution in the grayscale. In other words, there are too few increments, or steps, of gray to produce a smooth, noiseless transition between black and white. People in the TV manufacturing industry tell me that it will be at least three years before we'll see the problem solved."

The video signal processors inside plasma TVs have to do a lot of work to match the resolution of the incoming programs — in either a standard or high-definition format — to the panel's fixed number of pixels (its native resolution). In most cases the signal has to be de-interlaced and converted for display, a process known as scaling.

Since the resolution of standard TV is fairly low, it needs to be scaled *up* to fit the pixel count in plasma sets. Material in the most commonly used HDTV format, 1080i (interlaced) — which has a 1,920 x 1,080

pixel count — must be scaled *down* to fit the native resolution even of high-end plasma sets, which sacrifices some picture detail. The other high-definition format, 720p (progressive), requires a panel with at least 1,280 x 720 pixels to avoid reducing image quality. But no video signal format has a resolution of 1,024 x 1,024 pixels, so a panel with that pixel count needs to have *all* incoming video scaled.

Scaling isn't a problem as long as the processor does a good job, and some built-in scalers work fine. Still, people who want the best video performance often attach outboard processors to scale and otherwise process the video signal *before* it reaches the plasma panel. Outboard processors are available from a number of companies, including Faroudja, Runco, and Vidikron.

Plasma displays are generally excellent at handling computer signals, which can be modified at the source (for example, the PC's video card) to match the panel's pixel count. DVDs look great even on lower-priced widescreen plasma TVs because the native resolution of such panels — 852 x 480 pixels — exactly matches the specification for widescreen DVD. But panels with higher resolution and good scalers can make both DVDs and other video sources look even better.

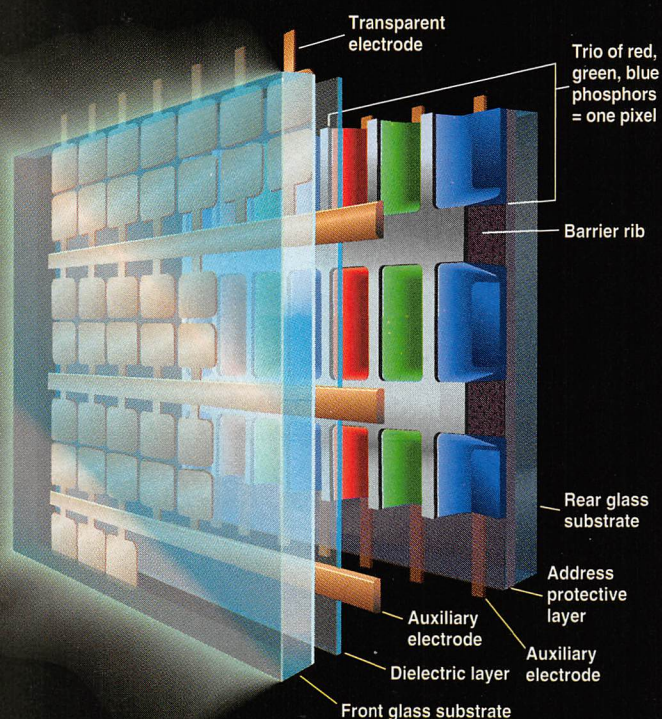
The other flat-panel technology — LCD, or liquid-crystal display — would seem to provide the same benefits as plasma. But LCD screens tend to run smaller than their gas-powered brethren since large-screen LCDs are even more expensive to produce than plasma displays.

What Price Plasma?

A couple of factors contribute to the high price of plasma. The first is the difficulty of making the glass — including those millions of tiny cells — for plasma panels, which is done by only a handful of companies, including Panasonic, Pioneer, Fujitsu, Hitachi, and NEC. In fact, the process is so tricky that today's manufacturing plants recycle 20% to 50% of their finished panels because the delicate glass is flawed in some way, according to Matt Dever, vice president of product planning for Pioneer.

The second has to do with economies of scale. The specialized components needed to make plasma TVs are expensive because relatively few are made. This leads the set manufacturers to charge high prices to recoup their costs, which means relatively few people can afford to buy plasma sets. Low sales numbers give the component makers little incentive to ramp up produc-

INSIDE A PLASMA PANEL



tion to make more components available at lower prices.

Both of these problems have begun to disappear as consumer demand and manufacturing know-how have grown, but the top manufacturers agree that traditional picture tubes will continue to dominate the TV market for at least the next few years. "Everybody who's ever said something like this has been proven wrong, but I'll say it anyway: plasma TV is never going to be inexpensive," says Sam Runco, CEO of high-end manufacturer Runco.

"Within two years or less," says Pioneer's Dever, "you will be able to find plasma displays in the \$100-per-inch price range," referring to diagonal screen-size measurements. "Our research has shown that consumers would be willing to go that extra stretch for the 'wow factor' of a plasma TV." Of course, most TV buyers are still likely to consider \$4,200 for a 42-inch TV expensive.

Fujitsu, a major supplier of panels to other brands, predicts that this year plasma-TV sales for home use will eclipse sales for industrial and business applications. Last year's sales figures for the U.S. support that projection.

"Growth in consumer plasma sales has been phenomenal, especially considering the slow economy we had in 2001," says Alessandra Almgren, president of the market-research firm Home Theater Research Group, which recorded nationwide sales of 26,000 plasma sets in 2001. That's an 81% increase over 2000, though it's still a tiny number compared with the sales of tube-based TV sets, which exceeded 23 million in 2001.

"Prices have been decreasing dramatically for 42-inch panels, which is where we've seen the strongest sales," Almgren says, adding that plasma looks even stronger for the coming years. "In 2005, we estimate 270,000 [plasma TVs] will be sold, and the street price for 42-inch [sets] will be around \$3,000."

Like any groundbreaking technology, plasma will need some time before it becomes both familiar and affordable enough to be taken for granted. Today, only a privileged few can lie down and watch late-night TV on the ceiling. But tomorrow, the breakneck pace of technological advancement, coupled with the inevitable drop in prices, will mean that a lot more people will be able to own an ultra-thin, high-performance, big-screen plasma TV set.

SW

Plasma TV Shopping Guide

MANUFACTURER	Model	Price ¹	Resolution (pixels)	Screen size (inches, diagonal)	HDTV/EDTV ²	Component-video input	HGB+HV input	VGA input	DVI input
Fujitsu 888-888-3424 www.plasmavision.com	PDS-6101	\$24,999	1,366 x 768	61	HDTV	✓	✓	✓	✓
	PDS-5002	\$14,999	1,366 x 768	50	HDTV	✓	✓	✓	✓
	PDS-4242	\$9,999	1,024 x 1,024	42	HDTV	✓	✓	✓	✓
	PDS-4233	\$5,999	852 x 480	42	EDTV	✓	✓	✓	✓
Hitachi 800-448-2244 www.hitachi.com/tv	CMP4120HDUS	\$8,999	1,024 x 1,024	42	HDTV	✓	✓	✓	✓
	42HDT20 ³	\$8,000	1,024 x 1,024	42	HDTV	✓	✓	✓	✓
	32HDT20 ⁴	\$6,000	1,024 x 852	32	HDTV	✓	✓	✓	✓
Marantz 630-741-0300 www.marantz.com	PD6120D	\$29,000	1,366 x 768	61	HDTV	✓	✓	✓	✓
	PD5010D	\$21,000	1,366 x 768	50	HDTV	✓	✓	✓	✓
	PD4293D	\$9,999	852 x 480	42	EDTV	✓	✓	✓	✓
Panasonic 800-211-7262 www.panasonic.com	PT-50PD3	\$16,000	1,366 x 768	50	HDTV	✓	—	✓	—
	PT-42PD3-P	\$8,000	852 x 480	42	EDTV	✓	—	✓	—
Philips 800-531-0039 www.philipsusa.com	32FD9954 ⁵	\$5,999	852 x 480	32	EDTV	✓	✓	✓	✓
Pioneer 909-629-3442 www.pioneerelectronics.com	Elite PRO-1000HD	\$17,500	1,280 x 768	50	HDTV	✓	✓	✓	—
	PDP-5030HD	\$15,500	1,280 x 768	50	HDTV	✓(2)	✓	✓(2)	—
	PDP-4330HD	\$11,500	1,024 x 768	43	HDTV	✓(2)	✓	✓(2)	—
RCA 317-587-4450 www.rca.com	HDP50300	\$13,999	1,365 x 768	50	HDTV	✓	✓	✓	✓
	PR42300	\$6,999	852 x 480	42	EDTV	✓	✓	✓	✓
Runco ⁶ 800-237-8626 www.runco.com	PL-61cx	\$32,995	1,366 x 768	60	HDTV	✓	✓	✓	—
	PL-50c	\$21,995	1,280 x 768	50	HDTV	✓	✓	✓	—
	PL-42cx	\$15,995	852 x 480	42	EDTV	✓	✓	✓	—
Samsung 800-726-7864 www.samsungusa.com	HPL5025	\$13,999	1,366 x 768	50	HDTV	✓	✓	✓	—
	SPL4225	\$6,999	852 x 480	42	EDTV	✓	✓	✓	—
Sharp 800-237-4277 www.sharppusa.com	PZ-50HV2U	\$14,995	1,280 x 768	50	HDTV	✓(2)	✓	✓	—
	PZ-43HV2U	\$12,995	1,024 x 768	43	HDTV	✓(2)	✓	✓	—
Sony 800-222-7669 www.sel.sony.com	PFM510A2WU	\$14,000	1,024 x 1,024	42	HDTV	✓(2)	✓	✓	—
	PFM500A3WU	\$9,000	852 x 480	42	EDTV	✓(2)	✓	✓	—
	PFM42B1	\$8,000	1,024 x 1,024	42	HDTV	✓(2)	—	✓(2)	—
	KZ-42TS1	\$8,000	1,024 x 1,024	42	HDTV	✓(2)	✓	—	—
	KZ-32TS1	\$6,000	852 x 1,024	32	HDTV	✓(2)	✓	—	—
Toshiba 800-631-3811 www.toshiba.com/tacp	50HP81	\$16,000	1,366 x 768	50	HDTV	✓	✓	✓	—
Zenith 847-391-7000 www.zenith.com	DPDP60W	\$24,999	1,280 x 720	60	HDTV	✓	—	✓	—
	P60W26 ⁵	\$20,000	1,280 x 720	60	HDTV	✓	✓	✓	—
	DPDP40V	\$6,999	640 x 480	40 ⁷	EDTV	✓	—	✓	—
	P42W26 ⁵	\$6,000	852 x 480	42	EDTV	✓	✓	✓	✓

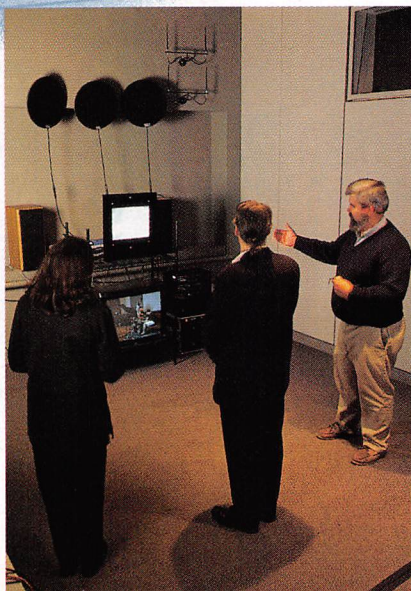
All information was supplied by the manufacturers. All sets have both composite- and S-video inputs; all screens have 16:9 aspect ratio except where noted. ¹ Manufacturers' quoted prices; dealer prices vary. ² HDTV = high-definition TV; EDTV = enhanced-definition TV. ³ Available in May. ⁴ Available in April. ⁵ Available in June. ⁶ All Runco plasma TVs include an outboard video processor. ⁷ 4:3 aspect ratio.

Digital Dreaming

MIT's legendary Media Lab is inventing the future of home entertainment **by Michael Antonoff**



Founded in 1985, the Media Lab at the Massachusetts Institute of Technology has a charter to “invent and creatively explore new media for human well-being and individual satisfaction without regard to present-day constraints.” And you can’t help but get caught up in the enthusiasm of the researchers, associates, and professors as you wander around the Lab’s building across the Charles River from Boston. Though their ages span three generations, they all think of themselves as young people unbound who are helping to invent the future.



I have come here to sample their wares. But unlike at a trade show like CES (see page 76), where many of the products on display are available within a few months, the work produced at the Media Lab is true Future Tech — it won’t appear in your home until later in the decade at earliest.

Disc-shaped Audio Spotlights (above and left) can direct sound to a particular spot so that individual listeners can focus on different instruments in a recorded ensemble or even hear totally different programs.

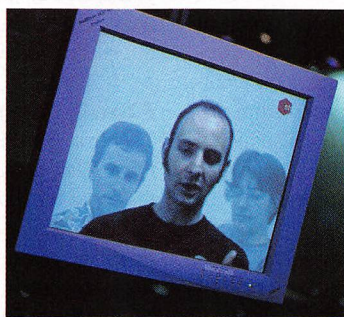
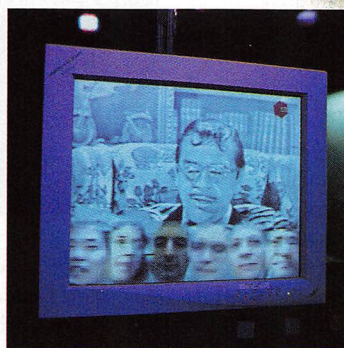


Future Power

Helping me to explore the new technologies that will transform our living rooms is V. Michael Bove, principal research scientist in the Lab's Object-Based Media Group. Bove points out that set-top boxes like hard-disk video recorders with downloadable electronic program guides are already sneaking a tremendous amount of connectivity, processing power, and data storage capacity into the living room. This will lead, he says, to highly interactive devices that go well beyond anything available today.

For example, a Lab-developed tool called Viper allows a TV show's producers to embed a smart timeline in a program so it can be re-edited on the fly. Say you want to record *60 Minutes* on your hard drive but have only 30 minutes to spend watching it. With the help of Viper, you could watch a half-hour version of the program based on edit options the producers already placed there, without having to do any of the selecting yourself.

"A lot of what we're doing here," Bove says, "assumes that the processing power in home-entertainment devices will increase in the same way it has in PCs for the last 10 or 15 years. Now that those entertainment devices use the same kind of microprocessors, they're subject to the same rules. So you can assume a fixed cost for a device that will get more powerful — have more storage and bandwidth, and higher-quality outputs — every year for the foreseeable future."



Top, Cameras mounted in their TVs allow friends watching *Friends* to share snippy back talk. Middle, a demonstration of the principle using a recorded segment from the old *Ernie Kovacs Show*. Bottom, a demo of a three-way video chat where whoever is talking is automatically highlighted.

Eye on TV

If you believe the people around the Media Lab, TV sets will soon feature small cameras that allow other people to watch you watching TV. These set-top or embedded cameras will use facial-recognition software so that the TV will know which family member has picked up the remote. The set can then respond according to that person's preferences without the viewer having to press any buttons. For example, Dad's default channel might be ESPN, and the TV will know that he likes the volume cranked up fairly loud. But if it recognizes Mom instead, it will offer *her* favorite channels. And because she's not losing her hearing like her husband, it'll set the volume at a more moderate level.

Connect the camera to the Internet, and the isolated, private activity of TV watching could become more of a shared, social experience. Fans of *Buffy the Vampire Slayer* and other programs can already watch TV with their laptops nearby and go to online chat rooms to type messages to each other during the broadcast.

"We want to make a video chat room," says Bove. "We have a face finder that's a less sophisticated version of the ones they're using for security at airports. It doesn't recognize who the faces are, though. It just picks them out." The Media Lab's setup puts the faces of your friends who are also watching the show along the bottom of the screen so you can talk to them. And unlike a Web cam, where you have to sit perfect-

ly still exactly 2 feet away from the lens, the TV camera would be able to stay focused on your face as you move around the room.

I want to see this system in action but Bove has only a canned demo to show me, with the faces of six viewers appearing on the bottom of a TV screen showing the old *Ernie Kovacs Show*. I can't help but think of the characters forced to watch bad movies on *Mystery Science Theater 3000*. Who wants to have their mug shots plastered across other people's TV screens anyway? Probably the same people who gather outside *The Today Show* studios hoping to be on camera. More to the point: who wants to watch *other* people watching TV?

Another mocked-up TV in Bove's lab shows a video conference from three locations. Whenever someone talks, his face automatically comes to the foreground. When he stops talking, his face grays out and drops to the back. While this might prove useful, unless they start harmonizing, it's not exactly entertainment.

Video cameras sprout up around the Media Lab like daisies in August, not to spy on people but to allow for personalized applications. At the Spatial Imaging Group, for instance, an infrared camera tracks a viewer's red-eye reflection (the same reflection that makes people look like they're possessed in flash photographs) to create a stereoscopic image on a flat screen without the need for 3-D glasses. When I check out an image of a car, it seems to pop out of the screen.

At the Context Aware Computing Group, an eye-tracking camera watches someone using what research scientist Ted Selker calls the Multimedia Bed. An image of the night sky is projected on the ceiling as long as your eyes are open. "It's like lying outside under the stars at night," Selker says. If you've set a wake-up time, the camera checks to see if your eyes are open at the appointed hour and then projects a sunrise on the ceiling. By blinking rapidly, you can change the accompanying music.

Music for One

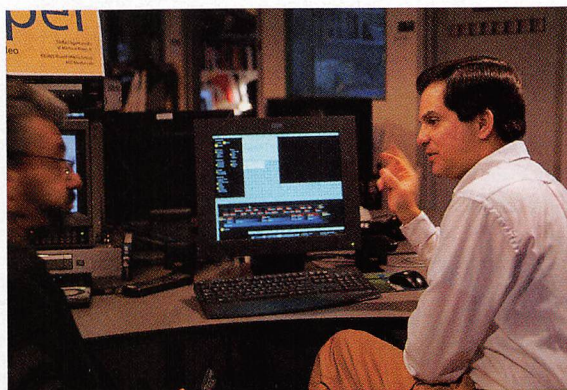
In the most intriguing demonstration, I find myself facing a pair of conventional speakers, two TV screens, and three pizza-size discs hung high on the wall behind the screens. On one of the TVs, a pianist, bassist, and drummer play jazz, which emanates from the speakers. When I walk to the left side of the room, I can suddenly hear a female singer and see her performing on the second TV. When I move to the center of the room, the audio and video focus changes from the vocalist to a violinist. When I walk to the right side of the room, the violinist fades out and a trumpeter plays along. Standing in three discrete spots, no more than 5 feet apart, I can hear and see three different performers.

This artistic installation, titled "In Place Performers" and designed by Barry Vercoe, Professor of Media Arts and Sciences, demonstrates a technology Media Lab researchers call the Audio Spotlight. Invented by F. Joseph Pompei, a Ph.D. candidate at the Media Lab and a former Bose engineer, the Spotlight is a disc that allows sound to be aimed at a particular area of a room. The sound is converted into high-frequency (60-kHz) waves, which move in a straight path. While this ultrasound is inaudible when you stand near the discs (insects can hear it, but not dogs), the inability of air to sustain the wave causes it to begin to come apart when it travels

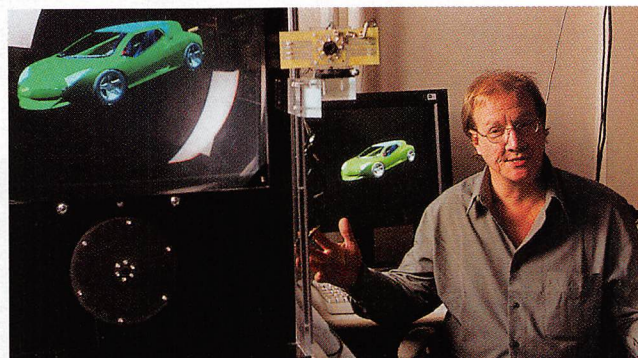
about 4 or 5 feet from the disc. The encoded audible sound falls out of the carrier wave as the wave disintegrates. If you happen to be in its path, you hear the localized sound.

Each disc holds an array of about 50 tiny speakers. Only a fraction of an inch in diameter, each speaker puts out a tiny amount of acoustic energy. The Spotlight works well with sopranos and higher-frequency instruments like trumpets and violins, but it can't deliver much punch when it comes to bass and percussion, which is why those instruments are heard from conventional speakers.

The audio and video for the installation are provided by four synchronized DVD players — one for



V. Michael Bove (near left) shows off Viper, a video-editing program. Below, Steven L. Smith, a research scientist in the Media Lab's Spatial Imaging Group, demos technology that makes flat images appear three-dimensional to the naked eye — no special glasses needed.



the trio and another for each of the three soloists. The video of the soloists is passed through a holographic diffuser and projected on striped glass, which shows a different image depending on where you're standing. Most of the applications that could result from the Audio Spotlight technology, however, can be accomplished without using a video display.

Alone Together

The first Spotlights could appear in products sooner than you think. Daimler Chrysler has already shown a concept car in which disc speakers built into the ceiling of an SUV let different sounds be aimed at particular passengers. Teenagers could groove to techno music in the back seat, say, while Dad listens to light rock or traffic reports in the driver's seat. And nobody would have to wear headphones. If you've ever been in a carpool where the driver and passengers argue over which radio station to listen to, you'll appreciate the concept — though Pompei acknowledges that the Spotlight's performance with bass frequencies needs more work.

At home, a couple could be sitting together in their living room, but the soundtrack from *Pearl Harbor* would be directed at the husband watching the movie at one end of the couch while his wife reads the paper at the other. A shrink on *Ally McBeal* once said that everybody needs his own theme song — that could become a reality with the Audio Spotlight. And if it means a wife never has to suffer through another football game, the technology could actual-

ly lower the divorce rate — unless, of course, she wanders into her husband's end zone.

Even surround-sound enthusiasts could benefit: if you aim a Spotlight at the rear wall from the front position, the reflection can serve as a virtual back surround speaker, eliminating the need to run wires across the room or even to find the space for an actual speaker. Pompei says that reflected ultrasound gives better results than current techniques for deriving virtual surround sound from a pair of front speakers because you would need only one flat-projection array aimed at multiple points in a room. The Spotlight also raises the possibility of audio-in-audio to complement picture-in-picture. Just lean a little to the left, Mr. Couch Potato, to hear what's playing in that PIP.

Pompei says the Audio Spotlight technology could be incorporated in consumer products in a few years. The disc arrays I heard at the Media Lab were handmade and cost tens of thousands of dollars. And the sounds of the vocalist, violinist, and trumpeter in the "In Place Performers" installation were thin. Still, the technology is intriguing. Initially, Spotlights are more likely to be used in public spaces like dance clubs. They could also be used in stores to pitch products while keeping the people who work nearby sane —

like the poor guy on Pier 39 in San Francisco who sold stuffed animals that looked like the dancing California Raisins and was forced to listen to "Heard It on the Grapevine" all day long. An Audio Spotlight would have stopped tourists dead in their tracks while sparing the guy behind the counter.

Pompei says that the Spotlight could be used to beam jingles at shoppers as they walk down an aisle. "The boxes would be illuminated by sound," he explains. I'm wondering whether Tony the Tiger's "They're great!" would be thunderous enough to halt shoppers, or would it just sound lame, like chewing on soggy cornflakes?

My tour of the Media Lab ends at the bottom of an atrium that's sometimes used for cocktail parties. The bar, in fact, is an ancient mainframe computer. I was here in 1995 when hundreds of MIT alumni, Media Lab sponsors, and reporters gathered for the Lab's 10th anniversary. By the time its 20th anniversary materializes in three years, it will be interesting to see how close we are to being able to buy things like Audio Spotlights and TV sets that can tell who's watching. The intriguing technologies incubated in the Media Lab will ultimately have to fight for survival outside the lab, in the marketplace. **SW**

Our Bit-Sharing Future

When I asked Andrew Lippman, one of the founding faculty members of the Media Lab, to predict the future of home entertainment, he said, "You're asking the wrong person. I'm the guy who 20 years ago told the TV networks they were dinosaurs and would be gone by now." I persisted nonetheless. — M.A.

So where is home entertainment headed?

Anything you can imagine, we can do, but where it's going has less to do with technology than with culture, economics, and the law. It's clear that as media become digital, there is an inevitable shift of control from the source to the person receiving it. You're in control of your own bits in a way that you never were in control of your own sound and video in the analog world. The real question is: what is the culture going to make of it?

We're nearing the end of the era of products and entering the era of capabilities or programmability. Look at video recording systems like TiVo — suddenly prime time is *my* time. My daughter says, "Dad, you mean you *can't* pause the TV? Well, that's silly. I can pause anything that's happening on my computer."

How do you think the transition to HDTV is going?

We did a lot of the basic work on high-definition TV, and what's agonizing is that we got about 80% right. The other 20% is coming back to haunt us. We missed using a significant chunk of spectrum for mobility. The digital-TV spectrum is defined for fixed

service. But the big threshold today is having the bits move around with you. I don't care whether that means every traffic light or every car or every pulsing heart is online, whether every diabetic is having his or her insulin monitored, or whether it's being able to be in your car and know if there's a parking space three blocks away. The explosive growth in computing is going to be away from the desktop and toward the person.

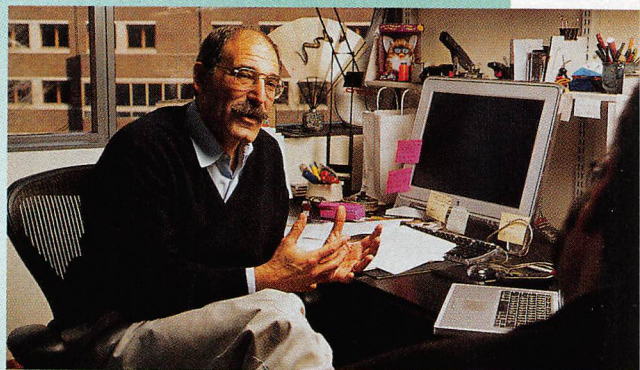
So home theater enthusiasts are benefiting from digital spectrum at the expense of people who want to watch little videos on their wrist-watches.

Yes, but we'll debug the technology to the point where we can use the spectrum for other things at the same time you're using it for TV and you won't even notice. You'll be able to have HDTV in your home theater while my 802.11 wireless computer network operates in the background. In the U.S. the broadcast spectrum follows a very strong ownership model. We give a chunk to WBZ, say, and they use it exclusively. But the technology is emerging to let us share spectrum.

The record industry was shaken to its roots by Napster — people distributing music themselves. Well, that's nothing compared with the network itself as a shared space. I checked into a lovely old hotel in New York a year ago, opened my computer, and I was online. It wasn't because of the hotel. Somebody's apart-

ment across the alley probably had a wireless network. If those people had walked past my house, they could have used mine.

Napster taught us that sharing works for things like digital recordings, largely because if I lend my bits to you, I still have them. So now you've got the technology arguing in favor of sharing and a culture growing up that is used to a shared, distributed environment. But you have an



economic and legal situation that aren't clear on how that works. Well, I think the culture is what wins in the end. You can't pass laws that go against the culture. They tried it with the 55-mph speed limit.

Is broadband at home the next big thing?

If you look around this laboratory, almost nothing relies on broadband. Most of what we do relies on intelligence and programmability and stuff that's small, agile, cheap, accessible, low-power, and works all the time. Broadband will come along for the ride, but it isn't in the critical path.

Guitar George

He was Beatle George,
he was solo George.
But he was always
George Harrison, musician.

by Ken Richardson



He may not have known *all* the chords . . . but he knew “a lot more than we knew,” as John Lennon said, remembering the day in 1957 when Paul McCartney introduced him to George Harrison. And that was enough for John to agree with Paul that George should join them in the band that would eventually become, with Ringo Starr, the Beatles.

Many of us remember the specific day — February 9, 1964 — when Ed Sullivan introduced the Beatles to America. At that time, George was playing his first “decent” guitars: the Duo Jet and the Country Gentleman, both by Gretsch. The Duo Jet is the same guitar you see here, photographed 23 years later for the artwork of his last solo studio album, *Cloud Nine*.

George Harrison (1943–2001) has been remembered as a songwriter, a film producer, a Hindu, and a fan of Monty Python. But he began as a guitarist, influenced by Scotty Moore, Chuck Berry, and Carl Perkins. His enthusiasm for the rockabilly picking of Perkins was especially keen. George even wore blue suede shoes.

However, he didn’t wear the hat of soloist for many of the Beatles’ guitar solos. “You Can’t Do That”? That’s John. “Good Morning, Good Morning”? That’s Paul. Ah, but the “Birthday” riff was written by George, right? No, Paul again. Ah, but the “I Feel Fine” feedback must have been George, right? No, John again. Occasionally, George even allowed others to play the solos on his own songs. That’s Paul on “Taxman” and Eric Clapton on “While My Guitar Gently Weeps.”

Sometimes, George *wanted* to play guitar but was edited. On “Please Please Me,” he originally played the distinctive descending phrase through the entire song — until an Abbey Road assistant producer said he should play it only “in the gaps.” On “Hey Jude,” he originally echoed each of Paul’s vocal lines — until Paul said no. And guitar parts devised by George were dropped from “I Should Have Known Better” and “Girl.” It seems there were times when the nickname “The Fifth Beatle” could have been given to guitarist George Harrison instead of producer George Martin.

“Hey Ken!” you must be shouting right about now. “How about a little respect for the dead!”

It’s with the utmost respect for the dead that I lay out all of the above. By clarifying what George *didn’t* play, we get a fresh appreciation for what he *did* play. And write. Besides, on the subject of somebody else taking the solos on his material, George said: “If it’s going to make my song sound better, it doesn’t matter to my guitar player’s ego.” He would also be quick to admit that, at first, guitar playing didn’t come easy for him; only by persistent practice did he succeed. And as for songwriting: “I have never thought about myself as someone who writes songs as a craft.

SOMETHING.

There's something in the way she moves
attracts me like no other ~~woman~~ lover,
Something in the way she wooo's me
I don't want to leave her now;
You know I believe and how;

~~It~~ Somewhere in her smile she ~~knows~~
that I don't need no other ~~woman~~ lover,
Something in her style that shows me
~~that~~ I don't want to leave her now
You know I believe and how.

You're asking me will my love grow,
I don't know - I don't know.
You stick around, and it may show,
(but) I don't know, I don't know.

[instrumental and countermelody.]

D - C - E - C - E - A.

(You know I love that woman of mine
and I read her all of the time...
and you know what I'm feeling to you,
that woman, don't make me blue.)

Mainly, the object has been to get something out of my system."

Respect? The Python in George would look at us right about now and remind us that, in the presence of giants like John and Paul, he had resolved to think of himself and Ringo as "economy-class Beatles."

Yet he practiced. He got "Something" and many more things out of his system. And the rest of us in economy class are the richer for it.

He often practiced to the point of perfectionism. For "Baby's in Black," he worked diligently on the opening lick, recording take after take. For "I'm Only Sleeping," he spent six hours on his "backwards" guitar solo. It was actually two solos, one clean and one distorted. And instead of merely recording the solos and then running the tape backwards, George did this for each: 1) wrote a melodic solo, 2) had it *transcribed* backwards, 3) played it as transcribed, and 4) recorded it with the tape running backwards — so that the solo came out forward again! Got that?

George brought many other innovations to the Beatles and to the rest of pop music: 12-string guitar (which he first recorded for "You Can't Do That"), volume-pedal dynamics ("I Need You"), dissonance ("I Want to Tell You"). And he took a fine song like "Norwegian Wood (This Bird Has Flown)" and made it even finer by adding the first sitar to appear on a pop record.

That was a far cry from 1958, when he and the rest of John's pre-Beatle band, the Quarry Men, recorded "That'll Be the Day" and a McCartney/Harrison song, "In Spite of All the Danger," in a Liverpool living room. You can hear both songs on the Beatles' *Anthology 1*, and whereas George runs out of ideas for his solo on the first, he makes it all the way through his turn on the second. Not bad for a 15-year-old.

But George's career of solos really began in 1963 with Beatle Album 1, *Please Please Me*, Track 1, "I Saw Her Standing There." His urgent break is primitive but

absolutely right. And over the next few years, George would develop his playing in several styles. He wove acoustic solos with grace ("Till There Was You"). He simply but artfully expanded on a song's main melody ("I Should Have Known Better"). He decorated tracks with inventive fills ("Help!"). And he mastered the art of bubbling under ("Act Naturally").

Great stuff all, but two other early solos stand tallest. In "All My Loving," George grabs your attention with four notes and then strums through a 12-second masterpiece. And in "Can't Buy Me Love," his break is as giddy as Paul's vocal. Listen to the version on *Anthology 1* for proof that George worked hard on his solos.

Listen to the next stage of the Beatles' development, in 1966 and 1967, for proof that they had a strong hand in the birth of hard rock. Here, George was often playing in tandem with (or in counterpoint to) John or Paul's additional lead guitar. The fierce, nasty, loud results are nothing less than astounding: "Paperback Writer," "Rain," "She Said She Said," "And Your Bird Can Sing." Go forward to 1968 and *The Beatles* (a.k.a.

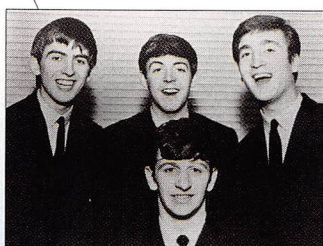
The White Album) and you get a veritable hard-rock clinic on what used to be, in the days of vinyl, Side 3: "Birthday," "Everybody's Got Something to Hide Except Me and My Monkey," "Helter Skelter." Not that there's anything wrong with the contemporaneous B-side "Revolution." In the midst of these gloriously noisy years, George could still give a track like "Fixing a Hole" some delicate fills, a skipping line, and a precise solo. And he gave a few seconds of acoustic bliss to the start of "Flying."

The final years of the Beatles saw George, after getting back to basics for what would become *Let It Be*, playing like a painter for the band's true swan song, 1969's *Abbey Road*. This is indeed guitar art, from the pop figures of "Octopus's Garden" to the chiming lines of "She Came in Through the Bathroom Window,"

from the grinding multitracking with John on "I Want You (She's So Heavy)" to the guitar battle with Paul and John at "The End." But George's pinnacle as a guitarist is "Something," with its tantalizing refrain and its beautiful solo — the single best solo in his entire recorded canon. Good thing he edited himself here, as he first wrote a countermelody verse before thinking of that solo (check out *Anthology 3*).

Most would agree that "Something" is George's pinnacle as a writer, too. (It's also clear that he's pretty high up as a singer. His sensitive phrasing here is a long way from "I Need You" and the cuteness of "Please remember how I feel a-bouchu.") When we gather all the songs he wrote for the Beatles, we see a body of work that held its own. If Apple/Capitol wants to do a tribute, one thing it could do is give his official Beatle recordings their day in the sun by putting them on a special-edition disc: "Don't Bother Me," "I Need You," "You Like Me Too Much," "Think for Yourself," "If I Needed Someone," "Taxman," "Love You To," "I Want to

'63



'68



Tell You," "Within You Without You," "Blue Jay Way," "Only a Northern Song," "It's All Too Much," "The Inner Light," "While My Guitar Gently Weeps," "Piggy," "Long, Long, Long," "Savoy Truffle," "I Me Mine," "For You Blue," "Old Brown Shoe," "Something," and "Here Comes the Sun."

What can we learn from these songs? The music for nearly all of them gets excellent mileage out of long, melancholy phrases. The lyrics for many of them express that melancholy as a kind of solitude: "So, go away, leave me alone, don't bother me." "Please, come on back to me, I'm lonely as can be, I need you."

George's later lyrics are effective in quoting and making variations on a spiritual theme: "The farther one travels, the less one knows." "We were talking — about the love that's gone so cold / And the people who gain the world and lose their soul." Those two songs, "The Inner Light" and "Within You Without You," can be heard with "Love You To" as a mesmerizing triptych of Westernized Indian music, anticipating the popularity of world music by decades. At the same time, George could rock with the best of them in "Taxman" and "It's All Too Much." Hot tip: to dig deep into the layers of the latter, hear its stereo remix on the *Yellow Submarine Songtrack* and especially its 5.1-channel remix on the movie's DVD.

Looking at some of the coverage of George's death, you'd think the acoustic gem "Here Comes the Sun" actually marked the sun setting on his creativity. But his solo career lasted three times as long as his tenure with the Beatles. It had its ups and downs, to be sure, but it included some rich music that has been unjustly ignored.

Take his first solo album, *Wonderwall Music* (1968). Asked to write a movie soundtrack, George tried to create "an an-

thology of Indian music." And he succeeded admirably, leavening the Eastern sounds with Western influences from vaudeville to rock. It's a fascinating listen. Unfortunately, many who haven't listened assume it should be lumped with George's next album, *Electronic Sound* (1969). Here, he took one of the first Moog synthesizers and basically let it rip and blip and burp. *Not* a fascinating listen. Or, as George's colleague Alvin Lee once defined "avant-garde": "aven't-got a clue."

But then came The Big One: *All Things Must Pass* (1970), with its No. 1 hit, "My Sweet Lord." When he remastered the set last year — the first step in a comprehensive (though now up-in-the-air) reissue program for his albums, many of which are out of print — George wrote: "I still like the songs and believe they can continue to outlive the style in which they were recorded. It was difficult to resist remixing every track. All these years later, I would like to liberate some of the songs from the big production that seemed appropriate at the time but now seems a bit over the top, with the reverb in the wall of sound."

The lowercase "wall of sound" he refers to is, of course, the uppercase Wall of Sound that is the trademark of Phil Spector — who, though listed as co-producer with George, is primarily responsible for the album's often way over-the-top sonics. In retrospect, many of the big numbers — "Wah-Wah," "Isn't It a Pity," "What Is Life," "Awaiting On You All" — sound cluttered. Listen instead to the more subtle "also-rans," which also benefit from more subtle writing: the country-style "Behind That Locked Door," the heart-tugging "Run of the Mill," and especially the sweeping "Beware of Darkness," one of George's very best songs.

How would *All Things* have sounded without passing through Spector? You can get an idea from a stripped-down run-through of "Let It Down," included on the reissue as a bonus track (along with the un-

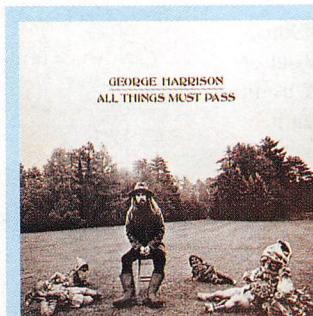
released "I Live for You"), and the demo of the title track on the Beatles' *Anthology 3*. Hear, too, the *All Things* material on *The Concert for Bangla Desh* (1971) — which, though again co-produced by Phil and George, sounds more boiled-down. Ironically, whereas Spector usually makes a studio seem like the Roman Colosseum, here he helps make Madison Square Garden sound like a nightclub.

All Things Must Pass remains George's most celebrated album. But the sun didn't set there, either. The studio follow-up, *Living in the Material World* (1973), has an attractively cozy sound. It also has stronger songs than it's usually given credit for. Besides the beautiful wave of melody and words in "Give Me Love (Give Me Peace on Earth)," the album boasts the trenchant humor of

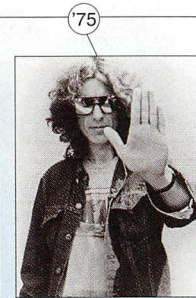
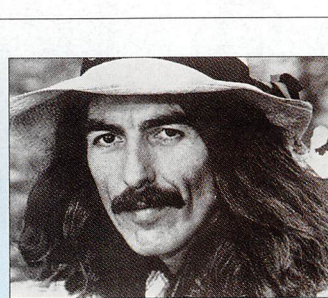
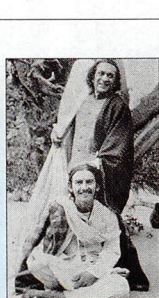
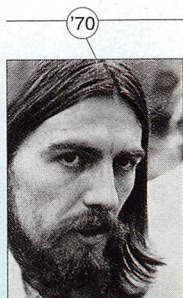
"Sue Me, Sue You Blues" and the irresistible vocal hook of "Don't Let Me Wait Too Long."

By the time of *All Things* and *Material World*, George had adopted the delicate but evocative slide-guitar style that would not only mark his solo career but also prove influential on other guitarists. Yet he would often hide his slide under a bushel, deferring to other players. The first solo we hear on *All Things*, for "I'd Have You Anytime," is by Eric Clapton, who plays on much of the album. And *Material World* is hardly a guitar showcase, although the solos that are there — the sweet ones for "Give Me Love" and "That Is All," the sassy ones for "Sue Me" and the title track — are more than commendable.

Both the playing and the writing started to dry up on *Dark Horse* (1974), but the album can't be written off, if only for two standout tracks. "Simply Shady" is a solid song about one particular *annus horribilis* for George, and "So Sad" is an achingly sorrowful lament over his disintegrating marriage to his first wife, Pattie. It's much easier to write off 1975's



***All Things Must Pass* (1970): the original release on three LPs. And the music did pass, from Fab to Phil.**



Extra Texture (Read All About It), whose only real news is the obvious but respectable sequel “This Guitar (Can’t Keep from Crying).”

Happily, George staged a comeback with *Thirty-Three & 1/3* (1976). It’s unfortunate that not many people noticed. Three songs — the funky “Woman Don’t You Cry for Me,” the sublime “Beautiful Girl,” and the grand “See Yourself” — were begun by George in his late-Beatle days, and they get knockout updates here. Spiritual songs like “Dear One” and “Learning How to Love You” sound fresh. Then there’s the humor. The “Lord” in “Crackerbox Palace” isn’t *the* Lord but rather the 1960s comedian Lord Buckley. The hilarious “This Song” — George’s response to being sued for “unconsciously” plagiarizing “He’s So Fine” in “My Sweet Lord” — features a double cameo by Monty Python’s Eric Idle: “Could be ‘Sugar pie, honey bunch’!” “Nah, sounds more like ‘Rescue Me’!” And George’s guitar stages a comeback, too, tersely mischievous on “Woman,” gorgeously longing on “Beautiful Girl,” and nicely frisky on “This Song.”

After that high point, *George Harrison* (1979) was a decided letdown, primarily because most of it was written in Hawaii under the influence of both tropical skies and “magic mushrooms.” Notice how “Not Guilty,” another Beatle-era composition, has mellowed since its tough appearance on *Anthology 3*. The strongest track here is “Blow Away,” which is *not* a Hawaii song. Rather, it has George sitting in the rain outside his English home, awash in depression, until — here comes a Beatlesque pop melody!

So, does *Somewhere in England* (1981) signal a full return? No. In fact, George’s record label initially rejected the album. George deleted four songs and resubmitted it with four new ones, including his pointed if didactic response to the rejection, “Blood from a Clone,” as well as his heart-

felt response to John’s murder, “All Those Years Ago.” George’s next response was to shrug everything off and tell the world that he had once again *Gone Troppo* (1982), an album that was dismissed by the press as quickly as John’s *Some Time in New York City* and Paul’s *Wild Life*. Heard today, it actually gets off to a hopping start. The second half, though, is indeed a snooze, and George’s guitar takes a distant back seat to fat synths.

After that (and five years out of action), it’s no wonder that *Cloud Nine* (1987) was perceived as a return to form. Co-producer Jeff Lynne deserves credit for helping George seem lit up again — but he did it via the latter-day sound of his own former band, the Electric Light Orchestra. Accordingly, “This Is Love” is chunka-chunka ELO, “Just for Today” is piano-ballad ELO, and “When We Was Fab,” though fun, is George doing ELO doing the Beatles. The title song sounds a lot looser as played by Eric Clapton’s band on George’s *Live in Japan* (1992), a set that includes some fine work from both guitarists. Yes, *Cloud Nine* is a jaunty affair, but its best moment is a cover, the rip-roaring “Got My Mind Set on You,” which blasts out of this album

the same way it did over the airwaves on its way to No. 1.

George had one more true comeback in him — as a member of the Traveling Wilburys with Roy Orbison, Bob Dylan, Tom Petty, and Lynne, who casually joined forces in 1988 for *Vol. 1*. George’s contributions — “Handle with Care,” “Heading for the Light,” “End of the Line” — are among his most effortlessly engaging moments, and his slide guitar makes a dramatic return. It’s even more dramatic two years later on the band’s second set, which, in another nod to the Pythons, is called *Vol. 3*. By this time, Orbison had died, but the survivors cranked up the sound and rummaged joyously through their influences. And they went out doing the “Wilbury Twist.”

George was completing a new solo album at the time of his death, but he ultimately went out singing “Horse to the Water,” which he co-wrote with his son, Dhani, and recorded in October for *Jools Holland’s Big Band Rhythm & Blues*. George sings: “A preacher out there warned me about Satan / I said, ‘Hey, man, let’s hear about God-realization, for a change’ / He said, ‘We don’t got time for that / First, you must hear of the evils of fornication.’” And George lists the song publisher not as “Harrisons” but as “R.I.P. Limited 2001.”

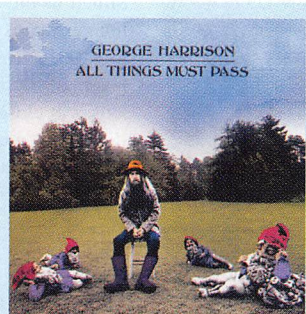
After I laugh with George, I like to remember that this self-described Dark Horse finally did go to the water and drink long: his ashes were scattered on India’s sacred Ganges River.

In his tribute in *The Village Voice*, Ed Park wrote: “At Strawberry Fields in Central Park last Friday night, there was the inevitable sing-along, under a bright moon and with small leaves falling slow as snow. . . . This ritual will happen twice again, little hedges against oblivion, before it all becomes the music of ghosts.”

Still, we may be able to transcend oblivion, as George Harrison believed. As he wrote in his book *I Me Mine*, “Funny how people say, ‘You’ve only one life, Squire.’ I’ve given up saying, ‘You’ve got as many as you like, and more.’ But it’s true. . . . Those people who you know much more easily or more quickly are people you’ve known in other lives.”

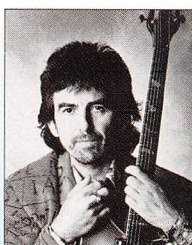
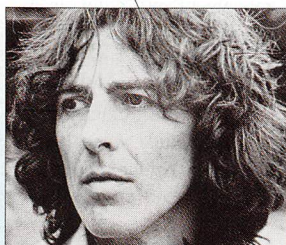
So, when you get to *your* next life, if you happen to come across a boy who, in the shadow of his boisterous friends, is quietly trying to learn a chord or two . . . remember to give him a bit of encouragement. “Ah, rock on, lad, one time for me.”

S&V



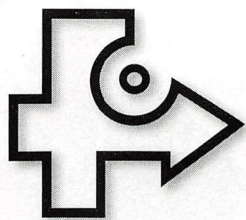
All Things Must Pass (2001): the 30th-anniversary edition on two CDs, with an outtake and other bonuses.

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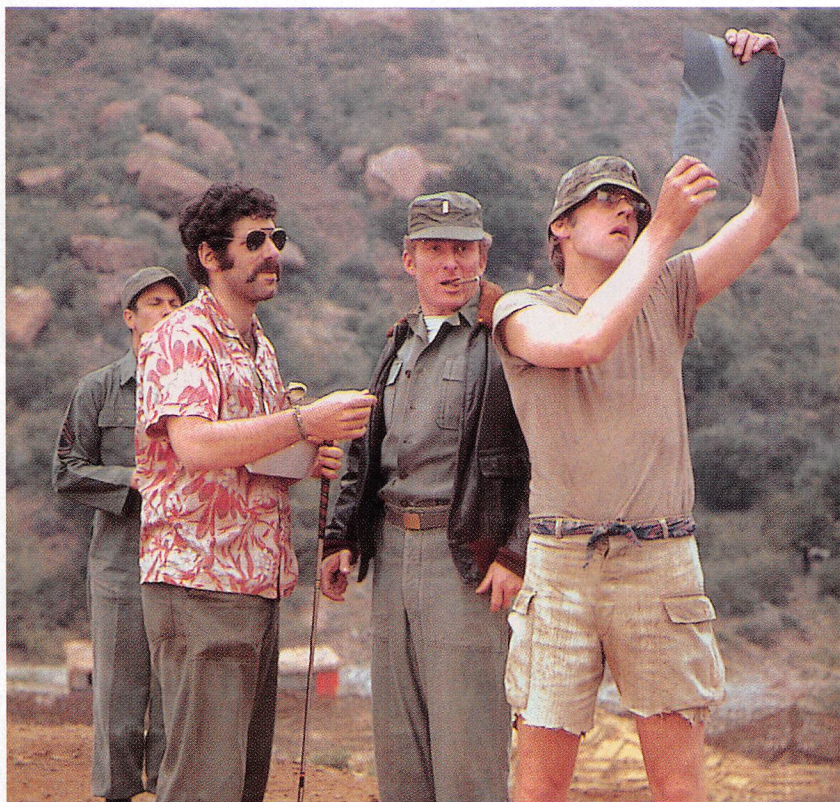
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Thanks to Mike Mettler for his research assistance on this story.



movies

entertainment



M*A*S*H

20th Century Fox

Movie ★★★★★

DVD ★★★★★

M*A*S*H: SEASON 1

20th Century Fox

Series ★★★★★

DVD ★★★★★

The familiar "Suicide Is Painless" theme fades up, and the camera follows a cluster of Army helicopters ferrying wounded to the muddy compound below. If not for the TV series that came later, this would simply be an elegant tracking shot buoyed by a tasty existentialist nugget disguised as a pop song. But the series did happen — before network TV lost its grip on the viewing public. The show's massively popular first run, followed by its years of high-profile syndication, elevated the story of *M*A*S*H* to the rarefied air of American iconography — a feat that the original movie, as challenging and successful as it was, never could have accomplished on its own. Now, the 1970 film and the 1972 first season of the TV series have been released simultaneously on DVD,

affording a great opportunity to compare and contrast.

An antiwar movie couched in black comedy, *M*A*S*H* was revolutionary in its day for the way it juxtaposed slapstick, farce, and low humor against the blood and gore of war. "Bad taste was our credo because nothing was in worse taste than those bodies that kept showing up," director Robert Altman says in his commentary. While Ring Lardner, Jr., won an Oscar for his screenplay, much of the film was improvised and shot in single takes. Even the crucial P.A. announcements that underline the absurdity of war were an afterthought, added during the final editing stages.

Although Altman refers to the movie's offspring as "that TV show with Alan Albert

or whatever his name is," *M*A*S*H* the series cannot be dismissed so easily. It had solid writing, acting, and production values, and its characters grew by leaps and bounds as the show matured. More important, along with *All in the Family*, it illustrated that TV viewers would accept material whose message veered to some degree from the numbing, formulaic mainstream.

*M*A*S*H* the movie gets a first-rate treatment on DVD. The original camera negative was unusable for the film's restoration, so Altman, overseeing the project, turned to the color-separation masters. The image retains the film's war-is-hell "dirty" look, which Altman had created by using layers of fog filters and shooting with zoom lenses in close-up. Standing in stark opposition to this muted look is the blood, which is as important a character as any person in the film, and the THX-approved transfer is at its best in the many highly realistic, grisly operating-room scenes. To further underline the chaos, the actors were miked individually, creating a tapestry of sound that was difficult to decipher in earlier video editions but has now been restored to its original clarity. Extras on the two-disc set include a short but fascinating featurette explaining the restoration process as well as four more documentaries. These cover a lot of the same ground but, when taken as a whole, serve up plenty of juicy material.

While the TV series gets clean, workmanlike transfers, the three-DVD set is all but bereft of extras. However, you can choose to watch each episode without its laugh track, thus letting you remove a key layer of condescension that even the best TV of the 1970s lacked the confidence to discard. ***M*A*S*H* (film):** English, Dolby Digital stereo and 2-channel mono; French, Dolby Digital 2-channel mono; letterboxed (2.35:1) and anamorphic widescreen; one dual-layer and one single-layer disc. ***M*A*S*H* (TV):** English, Dolby Digital 2-channel mono; French, Dolby Digital 2-channel mono; full frame (1.33:1); three dual-layer discs. *Marc Horowitz*

STAR SYSTEM

Stellar	★★★★★
Excellent	★★★★
Good	★★★
Fair	★★
Poor	★

Movie refers to the original film.
DVD refers to the film's presentation on disc, including picture and sound quality as well as extras.

MOULIN ROUGE

20th Century Fox

Movie ★★★★★ DVD ★★★★★

Moulin Rouge, a post-impressionist flurry of movement and color, is a tribute to all turn-of-the-century revolutionary artists who attempt to create something new. The film's form is a perfect reflection of its main theme — that of art consuming and resurrecting all experience, even love. Through the constant digital reshaping of im-

ages, combined with montage, dizzying dance, and impossible camera movements, director Baz Luhrmann expands and liberates the traditional movie musical. Using a manipulated mélange of instantly recognizable classic songs — Rodgers and Hammerstein layered on top of T. Rex — Luhrmann creates a language of interwoven, emotionally loaded fragments to completely engage the viewer.

The two-disc set contains a terrific THX-certified transfer that reproduces the intense visual styles from sepia to opulently rich color without bleeding, but with great detail and contrast. The soundtrack is full and crisp despite its complexity. Supplements are many and fine (see “Extras! Extras!” in “Random Play” in January). Most notable is the multi-camera presentation of three dance numbers, showing the shot you’ve chosen along with miniatures of the other available angles — another expression of Luhrmann’s belief in “audience-participation cinema.” **English, Dolby Digital and DTS 5.1; Spanish, Dolby Surround; letterboxed (2.35:1) and anamorphic wide-screen; two dual-layer discs.** *Josef Krebs*

BUFFY THE VAMPIRE SLAYER: THE COMPLETE FIRST SEASON

20th Century Fox

Series ★★★★★ DVD ★★★★★

If you’re already a *Buffy* fan, you know that it’s one of the sharpest things on TV, a show that manages to walk the line between tongue-in-cheek, pop-culture-obsessed teen comedy and genuinely creepy horror swathed in cliché subversion. If you’re not a fan, here’s a terrific opportunity to see what all the fuss is about.

Party annuals: Cumming, Leigh get digital with friends in *The Anniversary Party*



What’s Toulouse? John Leguizamo, Nicole Kidman, Ewan McGregor in *Moulin Rouge*

You get the first 12 episodes of the show (only 12 because it was a midseason replacement) in terrific DVD transfers along with scads of extras. Aside from interesting interviews (with series creator Joss Whedon and actor David Boreanaz) and the pilot script, far and away the best of the extras is the commentary Whedon provides for the first two episodes. He’s an ideal companion, extremely smart and funny, and I liked him right off the bat when he says that if you’re listening to the commentary, “you have far too much free time on your hands.” He also lets it be known that all the episodes here were shot in 16mm, which is pretty astonishing given their thoroughly atmospheric look. Like most network TV, *Buffy* is in Dolby Surround, so this won’t be anybody’s idea of a reference DVD set, but the sound is very good nonetheless — a real plus given that the show usually features live music. (In fact, just about every episode includes a live performance by an alternative rock band.) A terrific set in every regard; my

only regret is that Whedon didn’t have the foresight to shoot the show in widescreen. **English and French, Dolby Surround; full frame (1.33:1); three dual-layer discs.** *Steve Simels*

THE PRINCESS DIARIES

Disney

Movie ★★★ DVD ★★★★★

Anne Hathaway plays a high-school geek with frizzy hair and oversize glasses who, on finding she is heir to the throne of “Genovia,” is transformed into a beautiful young woman by her grandmother, played by Julie Andrews. Although Hollywood has frequently done this sort of ugly-duckling plot before, a splendid cast gives it new life.

The THX-supervised transfer is very good, presenting a rich, sharp picture, with sound that perfectly complements every scene. The extras, however, are a mixed bag. The documentary is throwaway fluff, while the eight deleted scenes, with explanations from director Garry Marshall, are excellent. There is also a very entertaining and informative commentary by Marshall and another chatty one by Andrews and Hathaway. **English and French, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer.** *Rad Bennett*

THE PARTY

MGM

Movie ★★★ DVD ★★★★★

THE ANNIVERSARY PARTY

New Line

Movie ★★★★★ DVD ★★★★★

What a difference three decades make. These two films cover the same territory — a Hollywood party populated by actors and other film types — but they couldn’t be more different in look, feel, and intent. Peter Sellers attends *The Party* (1968) as Hrundi V. Bakshi, a bit actor who accidentally blows up the set of his current film. After getting fired and blacklisted, his name mistakenly appears on the guest list for a party thrown by



Write on: Philip Seymour Hoffman advises Patrick Fugit in *Almost Famous*

the studio honcho overseeing the same film. What follows can only be termed slapstick farce, which is something director Blake Edwards (the *Pink Panther* movies) knows well. Even so, Sellers's comic flair outshines the rest of this movie.

Last year's *The Anniversary Party* was written and directed by actors Jennifer Jason Leigh and Alan Cumming, who also star as a shaky Hollywood couple celebrating their sixth year of marriage with 20 of their closest friends (played by Leigh and Cumming's real-life famous-actor pals). What might have become a self-indulgent mess actually evolves into a perceptive and engrossing character study thanks to a great ensemble cast. Kevin Kline, Gwyneth Paltrow, Parker Posey, John C. Reilly, Jennifer Beals, and other familiar faces often come dangerously close to playing themselves, which is no small part of the movie's sometimes voyeuristic appeal.

Both movies fare well on disc: *The Party*'s saturated, Technicolor-like palette springs vividly to life, while *The Anniversary Party*, which was shot in 19 days on digital video, displays textural richness and subtle shadings that leave little doubt about celluloid's dim future. Also included are a short *Anatomy of a Scene* documentary, an entertaining commentary by Leigh and Cumming, and the screenplay. ***The Party*: English, French, Spanish, and Portuguese, Dolby Digital 2-channel mono; letterboxed (2.35:1) and anamorphic widescreen; single layer. *The Anniversary Party*: English, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.**

Ken Korman

ALMOST FAMOUS, UNTITLED: THE BOOTLEG CUT

DreamWorks

Movie ★★★★★ DVD ★★★★★

Nowhere on the packaging of this DVD does it say "director's cut." That's because this complete reworking of writer/director Cameron Crowe's *Almost Famous* was never intended as the ultimate version of the film, just a "bootleg" cut with lots of extra footage — 35 minutes worth — to please fans who simply wanted more. So it's no surprise that *Untitled* doesn't really improve on

Almost Famous, although its fleshed-out characters and new bits of hilarity make for very worthwhile viewing.

A second disc contains the full theatrical cut of the film. A slew of additional extras further amplify Crowe's autobiographical tale of 15-year-old rock journalist William Miller's coming of age on the road with one of his favorite bands. You also get six convincing songs by the fictional band Stillwater (on a bonus CD), a director's commentary featuring Crowe's mom (she says the movie's all true), a woefully brief interview with legendary rock critic Lester Bangs, and lots more. **Both versions: English, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.77:1) and anamorphic widescreen. *Almost Famous*: English, DTS 5.1; French, Dolby Surround. Two dual-layer discs.**

Ken Korman

8½

Criterion Collection/Home Vision
Movie ★★★★★ DVD ★★★★★

8½ (1963) is the story of a famous filmmaker who, surrounded by hostile critics, a needy crew, and people from his complex personal life, is desperately in search of inspiration. His confused entanglements — which reach into his dreams, memories, and imaginings — are captured in complex, meaning-filled, elaborately choreographed widescreen compositions.

The crispness of the transfer brings out the details of these images, and the terrific high contrast makes the dark, shiny cars and jet-black suits look gorgeous. The picture is completely clean and free of damage, and the sound is equally clear. A 22-page booklet of essays accompanies the set's marvelous concoction of extras. Disc 1 includes a scholarly commentary and interviews with director Federico Fellini. Disc 2 includes more interviews and a stills gallery. Best of all, though, are Fellini's 52-minute documentary *Fellini: A Director's Notebook* and a 48-minute film on composer Nino Rota, whose classic score for 8½ combines with the beautiful images, inspired acting, and brilliant, comedic script to help make this film a ravishing and endlessly seductive pleasure. **Italian, Dolby Digital mono; letterboxed (1.85:1) and anamorphic widescreen; two dual-layer discs.**

Josef Krebs

MICKEY MOUSE IN LIVING COLOR

Disney

Shorts ★★★★★ DVD ★★★★★

SILLY SYMPHONIES

Disney

Shorts ★★★★★ DVD ★★★★★

Two strands of Walt Disney's work that ultimately led to his classic animated features have been given the deluxe treatment as double-disc collections with plentiful extras, each housed in an attractive tin case.

Mickey Mouse made his debut in *Steamboat Willie* (1928), a black-and-white cartoon that revolutionized the film industry. Disney quickly decided that his alter ego should star in Technicolor short films, making the transition with *The Band Concert* (1935). As Leonard Maltin points out in his introduction to the 27 adventures of *Mickey Mouse in Living Color*, Mickey wasn't very funny in his own right, so Disney developed Donald Duck, Goofy, and Pluto as comic foils for his nice-guy hero. It's fascinating to view these 1935-39 cartoons in production order, paying attention to the transformation and refinement of these characters into the ones that are known and loved today.

The 1930s *Silly Symphonies* were often studies for feature films to come, allowing the animators to comfortably develop new techniques and stretch the envelope. Thirty-seven shorts are included in this set, from the rather primitive *The Busy Beavers* (1931) to the remake of *The Ugly Duckling* (1939) with its sensitive full-character development and fluid animation.

The quality of the transfers in these sets is outstanding. *The Skeleton Dance* (1929) has been fully restored to crisp black-and-white, and the color shorts in both sets have been repaired to look brand-spanking-new. The mono sound has been refurbished and is now far better than you might expect. Both sets include intros by Maltin, galleries, and some vintage discussions of the cartoons by Disney himself. There are also hidden Easter-egg delights like *Who Killed Cock Robin?* (1935), with its marvelously on-target caricature of Mae West, and an interview with composer Richard M. Sherman concerning the vitally important music for the *Silly Symphonies*. **Both: English, Dolby Digital 2-channel mono; full frame (1.33:1); two double-sided discs.**

Rad Bennett

SCARY MOVIE 2

Buena Vista

Movie ★★ DVD ★★★★★

Effluvia. Gallons of effluvia. Rivers of urine, feces, vomit, and more. If you find that sort of thing outrageously funny, then you'll probably also enjoy the warmed-over gags and the predictable parodies of horror films and action-thrillers in this sequel to the

Quick Fixes

Wayans brothers' hit. Plucky teen Cindy (Anna Faris) and fellow first-film survivors Ray (Shawn Wayans), Brenda (Regina Hall), and Shorty (Marlon Wayans) are now college freshmen on a weekend class trip to Hell House, where they have close — very close — encounters with the mansion's horny ghost (Richard Moll) and other malevolent ghouls.

In the rich detail of DVD, the movie's flat lighting and cheap-looking sets seem worthy of some grade-Z release. The sound is likewise nothing to scream about. Extras include three throwaway shorts on the special effects and makeup plus behind-the-scenes interviews that are a wet kiss to the Wayans. If you are among those who *did* like the movie, you'll find additional laughs in the disc's six long deleted scenes. **English and French, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer.** *Frank Lovece*

LITTLE WOMEN (1933)

Warner

Movie ★★★★★ DVD ★★★★★

NOW, VOYAGER

Warner

Movie ★★★★★ DVD ★★★★★

Classic-film fans will be grateful for the care that has been lavished on these two legendary titles from Hollywood's Golden Age, each featuring a memorable performance from a female icon of cinema. *Little Women*, based on Louisa May Alcott's novel, concerns four sisters coming of age during and after the Civil War, and it seems to have been written specifically for the young, girlish Katharine Hepburn. The story is beautifully directed by George Cukor and is considered by many to be the finest of five film adaptations. *Now, Voyager* (1942) boldly tackles sexual repression, dysfunctional family units, and redemption through love. Bette Davis's performance is a tour de force and is nearly rivaled by that of Claude Rains as cinema's most sensitive shrink — he seems able to cure any malady save the leading lady's nicotine addiction.

The near-pristine, digitally cleansed transfer of *Little Women* is so extraordinary that viewing it seems like a completely fresh experience. Likewise, *Now, Voyager* has never looked or sounded better. With the crystal clarity of its transfer, you can read the fine print on travel posters and pick out every fleck in the star's celebrated eyes. Both films' impressively restored soundtracks feature a Max Steiner score, and each DVD includes the composer's original session cues — most intriguing on *Now, Voyager*, where we can actually hear Steiner instructing the musicians. With such meticulous attention to quality, it's curious that both transfers occasionally display hairs at the top and bottom of the frame (more

FOLLOWING

Columbia TriStar

Movie ★★★ DVD ★★★★★

The 16mm, black-and-white 1998 debut feature by *Memento* writer/director Christopher Nolan is a neat, wicked little thriller about a would-be writer who likes to follow people, a habit that gets him into a lot of noirish trouble. The film has a decent transfer and good sound. A chronological version of *Following* is also included — and since the movie's 71 minutes pack in almost as many twists as *Memento*, this can be very useful. Extras include an understated director's commentary and a script-to-screen feature. **English, Dolby Digital stereo; full frame (1.33:1); dual layer.** *Sol Louis Siegel*

BILL & TED'S EXCELLENT ADVENTURE

MGM

Movie ★★★ DVD ★★★★★

Before Wayne and Garth, before Beavis and Butt-head, the Western world thrilled to the exploits of Bill and Ted, two time-traveling teenage dimwits from the fictional suburb of San



Dimas, California. The film has dated a bit — 1989 seems like another world, suddenly — but it's still pretty funny (thanks mostly to stars Alex Winter and Keanu Reeves). The wide-screen transfer is first rate, and the bad L.A. hair-band soundtrack is well served by the Dolby Digital 5.1 mix. **English, Dolby Digital 5.1; letterboxed (2.35:1) and anamorphic widescreen; dual layer.** *Steve Simels*

THE ROAD HOME

Columbia TriStar

Movie ★★★★★ DVD ★★★★★

This unabashedly romantic and old-fashioned tale of love from Chinese director Zhang Yimou (*Raise the Red Lantern*) scores big with a simplicity and directness seldom seen in today's movies. Yimou's achingly beautiful wide-screen images — shot on location as the seasons changed in rural Northern China — seem to radiate a light all their own in this gorgeously atmospheric transfer. Zhang Ziyi, who was so memorable displaying her martial arts in *Crouching Tiger, Hidden Dragon*, shows a softer side

and, hence, a fuller range of her acting talents. **Mandarin, Dolby Digital 5.1; French, Dolby Surround; pan-and-scan, letterboxed (2.35:1), and anamorphic widescreen; single layer.**

Ken Korman

AND THEN THERE WERE NONE (1945)

Image

Movie ★★★★★ DVD ★★★★★

MURDER BY DEATH

Columbia TriStar

Movie ★★★ DVD ★★★★★

And Then There Were None is Agatha Christie's most-often-filmed novel, but this version, stylishly directed by the great René Clair, is justifiably regarded as definitive — owing to a great cast and a palpable fog-bound atmosphere of menace. *Murder by Death* (1976), written by Neil Simon, has the same setup — people who are trapped in a house and murdered one by one — but Simon injects comedy by using great-detective guests. David Niven and Maggie Smith do pitch-perfect impressions of Nick and Nora from *The Thin Man*, Peter Sellers is a terrific Charlie Chan type, and Alec Guinness is particularly priceless as the blind butler.

Apart from a little softness in the opening credits and the occasional scratch, the *None* transfer is sharp and extremely pleasing. The *Death* transfer is pretty much flawless in both letterboxed and full-frame formats. Neither DVD has any real extras. **None: English, Dolby Digital mono; full frame (1.33:1); single layer. Murder: English and Spanish, Dolby Digital 2-channel mono; pan-and-scan, letterboxed (1.85:1), and anamorphic widescreen; one double-sided disc.** *Steve Simels*

WITNESS FOR THE PROSECUTION

MGM

Movie ★★★★★ DVD ★★★★★

Another classic Agatha Christie thriller, improved upon through the sardonic wit of director/co-screenwriter Billy Wilder, comes to DVD in a glistening new widescreen black-and-white transfer that simply blows away all previous video versions. With more twists and turns than a roller coaster, this engrossing, splendidly acted 1957 whodunit is a must for every mystery fan as well as serious connoisseurs of great American cinema. **English and French, Dolby Digital 2-channel mono; letterboxed (1.66:1); dual layer.**

Mel Neuhaus

THE BIG HEAT

Columbia TriStar

Movie ★★★★★ DVD ★★★★★

Maestro Fritz Lang's uncompromisingly brutal 1953 film noir triumph at long last debuts on DVD. The expressionistic shadow-and-light-filled images are well represented in this reasonable, albeit slightly grainy 35mm black-and-white transfer, and the crisp mono soundtrack is fine. **English and French, Dolby Digital 2-channel mono; full frame (1.33:1); single layer.**

Mel Neuhaus

Reference DVD

BRAM STOKER'S DRACULA

Columbia TriStar

Movie ★★☆☆☆ DVD ★★★★★

Francis Ford Coppola's 1992 remake of *Dracula* was the last film I caught at the massive single-screen cinema in my hometown before it finally shut its doors, and watching it under such ideal conditions had a huge impact on me. Each one of Coppola's frames looked as carefully composed as a painting, and the way he layered images on top of one another infused even ordinary scenes with dramatic intensity.

I was brought back to that first screening by the new Superbit DVD edition of *Dracula* — one in a series of discs released by Sony that use lower compression rates in the transfer, at the expense of DVD extras. The disc's image



quality is nothing if not cinematic: colors look rich and robust, and the wide contrast range creates an almost three-dimensional effect. There's even enough detail to bring out the

texture of film grain — another factor adding to my nostalgia trip. The soundtrack, heard on a good system, is as impressive as the picture. In scenes where Jonathan Harker roams through Dracula's castle, the rear channels deliver a shifting fabric of bat noises, monstrous breathing, and ghoulish music. And when the Dark One makes his voyage to England, the ungodly sonic storm that he unleashes is something to experience. **English, Dolby Digital and DTS 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer.** *Al Griffin*

prominent on *Little Women*). However, it's a mild complaint and should definitely *not* prevent any collector from adding these DVDs to his library. **English, Dolby Digital mono; full frame (1.33:1); single layer.** *Mel Neuhaus*

BREATHLESS

Fox Lorber

Movie ★★★★★ DVD ★★★★★

LE PETIT SOLDAT

Fox Lorber

Movie ★★★★★ DVD ★★★★★

LES CARABINIERS

Fox Lorber

Movie ★★★★★ DVD ★★★★★

Those unfamiliar with the work of Jean-Luc Godard, arguably the most influential filmmaker of the last 40 years, will get a fine introduction through this three-disc set. *Breathless*, the Godard film that everyone can love, is probably the coolest, most youth-inspiring movie ever made. Its self-conscious stylizations and break-every-rule methodology have kept it from dating at all since it burst on the scene in 1960. The loose-fitting plot concerns a stylish rogue, on the run for killing a cop, and a delightful young American in Paris, who loves him but loves her freedom more. Short action scenes are shot in the streets and are further abbreviated through innovative jump cuts. Long, intimate scenes, beautifully lit and composed, dwell on the main characters' exploration of each other. With minimal narrative, Godard celebrates, reinvents, and explodes the film-noir genre — and cinema.

Le Petit Soldat (1963) examines the contradictions in the French-Algerian war of independence. Its plot, about a morally confused right-wing agent sent to assassinate a high-profile supporter of the Algerians' struggle, is more like an existential novel than a tradi-

tional movie, the sound being mostly voice-over philosophical questionings of the lead character. *Les Carabiniers* (1963) takes this break from naturalism even further, with a farcical allegory about two farm laborers who are recruited by a king to go fight, having been assured that they will be able to commit atrocities and steal with impunity. The film is purposely missing the action scenes and cinematic devices customarily used to celebrate or exploit combat, leaving the viewer to actually think about war.

All of the transfers, taken from newly restored prints, are completely clean and free of imperfections, in fairly clear mono sound. With *Breathless*, image contrast and detail are very good, and the subtitles — much fuller than in previous releases — reveal extra pieces of plot and character motivation, making the story even more enjoyable. A commentary by scholar David Sterritt also expands on the pleasure of the experience by analyzing the film's themes and style. The *Petit Soldat* transfer has good contrast with rich blacks, but the image isn't as sharp or detailed. Godard purposely lab-processed *Les Carabiniers* to look drab and muddy, and the transfer conveys this. Both *Soldat* and *Carabiniers* get a 15-minute mini-commentary, illustrated with clips, that helps viewers understand and appreciate these less accessible works. **French, Dolby Digital 2-channel mono; full frame (1.33:1); three single-layer discs.** *Josef Krebs*

THE STUNT MAN

Anchor Bay

Movie ★★★★★ DVD ★★★★★

Director Richard Rush's *The Stunt Man* is one of those movies that people remember when they talk about the 1970s being the last real golden age of American filmmaking. However, the film was actually made

in 1980, and its theme — basically, what is reality? — makes it a bit of a '60s throwback, which is not surprising given that Rush started out directing hippie exploitation flicks like *Psych-Out*. But *The Stunt Man* is superior to most mind-bend movies, and it boasts several knockout performances, in particular by Peter O'Toole as a megalomaniacal filmmaker.

The DVD is exemplary. The THX-certified, letterboxed transfer — from an original negative that seems to be flawless — looks super, with no color degradation to speak of, and the 6.1-channel and Dolby Surround mixes are extremely effective. Extras are almost too numerous to mention. You get a commentary by Rush and stars O'Toole, Steve Railsback, Barbara Hershey, Alex Rocco, and Sharon Farrell, along with trailers, deleted scenes, and a DVD-ROM-accessible screenplay. Better yet, there's a second disc with a two-hour making-of documentary directed and narrated by Rush; apart from being informative and funny, it's also a bravura piece of what-is-reality filmmaking in its own right. **English, Dolby Digital Surround EX, DTS ES Discrete, and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; one dual-layer and one single-layer disc.** *Steve Simels*

TIP Sheet

Coming Releases

BANDITS

Billy Bob Thornton and Bruce Willis (below) play the most unconventional bank robbers since Butch and Sundance. Extras include a commentary and two featurettes. **MGM, April**



ORGAZMO

This two-disc set of another classic from the creators of *South Park* comes with three commentaries: a drunken one by director Trey Parker, a cast-and-crew chat, and a "wild commentary" with adult industry cameos. There are also audition tapes, an hour-long documentary, behind-the-scenes footage, and an outtake reel. **USA, April**

HUSBANDS AND WIVES

No extras here — it is a Woody Allen movie — but it's one of his better ones, so it doesn't really matter. **Columbia TriStar, April**

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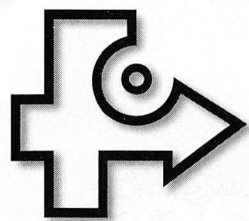
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EAGLES Hotel California Elektra

Music ★★★★★

DVD-Audio ★★★★★

Five short years ago, engineer Elliot Scheiner picked up the phone, and *presto!* — his life changed. “I got a call from DTS to do the Eagles’ *Hell Freezes Over* in 5.1,” he told *Billboard*. “I said, ‘What’s that?’”

He would go on to do the multichannel versions of many classic albums. The Warner Music Group hired him as a consultant on DVD-Audio. Today, Elliot Scheiner is “the godfather of 5.1 mixing.”

That’s high praise, indeed, since it comes from Bill Szymczyk, the original producer of the Eagles’ *Hotel California*. And the DVD-A of that 1976 landmark, mixed for six channels by Scheiner with Szymczyk, is a long run from the tentative, elementary surround sound of *Hell Freezes Over*. In fact, it’s a glorious triumph — without question, Scheiner’s best multichannel work.

Stand in the doorway of *Hotel California*, and you’ll be taken immediately by the clarity of the title song’s main theme on acoustic guitar, placed nicely in the center channel. Then, the harmony guitar resonates from the left and right front channels more vividly than ever before, as atmospheric effects shimmer around you. With the two hits of his drums, Don Henley starts singing in a voice that seems newly robust, and the whole song blooms in a wonderfully realistic, three-dimensional soundstage. Comes

the second verse, and the countermelody on electric guitar rises up from the surround channels — just enough to make a cool impression without overwhelming the warmth of the front channels. Up ahead in the chorus, the vocal harmonies soothe you primarily from the front, as they should. By now, you’ve been inside for only two minutes, but Scheiner and Szymczyk have already shown you how they can create a remarkable surround experience. And if you’ve missed anything, there are four more verses and another chorus to come.


And then there are the guitar solos.

Whereas the original mix had both Don Felder and Joe Walsh in both stereo channels, the remix puts Felder in the right front and Walsh in the left front — all the better to witness their duel, and all the better to cheer their dance when they come together. In the end, the great achievement of the full 6½ minutes of this “*Hotel California*” is how *all* the guitars, once forced on top of each other in a Yertle-the-Turtle-like stack, can now breathe in their own individual spaces. At the same time, the song’s other instruments hold their ground, led by the newfound depth of Randy Meisner’s bass and the fresh crack of Henley’s snare. If you’re looking for the perfect song to demonstrate the capabilities of DVD-Audio specifically and multichannel music in general, look no further.

Not that there’s anything wrong with the rest of *Hotel California* on DVD-A. If I had the space, I could give a minute-by-minute account of *every* song, from the subtleties of “New Kid in Town” to the appropriately grand climax of “The Last Resort.” For now, I’ll have to focus on one important result of

Scheiner’s handiwork: whereas he has been known to lean heavily on the surround channels, here he uses them prominently but artfully. The rhythm guitars of “New Kid” and “Try and Love Again,” the clavinet of “Life in the Fast Lane,” the strings of “Wasted Time” — all come from behind without compromising the primary music in front. Even the low riff of “Fast Lane” sounds fine in the rear, especially when it’s joined by the high riff in front. As Szymczyk says, he and Scheiner wanted to “put the listener in the middle of the band” by “taking full advantage of the medium.” Yet they were careful to A/B the results with the album’s original stereo mix (which is provided here, too) so that the new mix wouldn’t end up sounding “radically different.” On each point, they’ve succeeded impressively.

Szymczyk makes those points in a brief video interview included as an extra — a department where this DVD-A emphatically does not succeed, since it’s the *only* extra here. No bio, no essay, no commentary, no photos. And no lyrics except those for the title song. Yeah, I know, the original LP didn’t give us the other lyrics either, but that was then, and this is DVD-Audio, a *multimedia*



Queen
A Night At The Opera

Program note: I had intended to compare *Hotel California* with another landmark album from the 1970s, Queen’s *A Night at the Opera*. But just as we were going to press, DTS postponed that DVD-Audio release until April 30. According to the label, the delay was necessary to accommodate a change in distribution. However, the six-channel mix is being revised — to what extent, though, isn’t clear. I’ll reserve final judgment until I receive a final copy, but based on an early version sent to reviewers, this *Opera* had become more nightmarish than rhapsodic. **K.R.**

REBUTTAL

DIANA KRALL The Look of Love Verve

Music ★★★★★ CD ★★★★★

In Francis Davis's stingy 2½-star review of Diana Krall's *The Look of Love* in the December 2001 issue, his statement that he "won't comment on the leggy CD cover" is surely a rhetorical device that is disingenuous if not trite. Most of the review is wasted in condemning the album not for its musical merits but for the sexual appeal of its marketing. You won't find the puritanical *Sound & Vision* doing that sort of marketing — not! See "Eve" on the cover of the May 2001 issue.

This resentment of an artist like Krall is an old story, one based on the lie that true jazz musicians don't find success until after they're dead. Or, if they are successful while alive, they must at least demonstrate that their success was hard-won out of pain.

Diana Krall is none of that. That she is young, talented, and beautiful, that her recordings are sophisticated, appealing, and seemingly effortless, all work against her in the atrophied minds of reviewers like Davis — reviewers who are always threatened by a new archetype, who cling onto old models of thought like false preachers to their unexamined values.

G. Matthew Wong



G. Matthew Wong, one of our readers, lives in Laurel, Maryland. Ever get the urge to write your own rebuttal to a review? You can e-mail your 200-word piece to Ken Richardson (soundandvision@hfmus.com). We'll pay you \$100 if we print your review.

format. Now you know why I've docked a full star from what could have been a perfect five-star format rating. Besides, the interview sounds buzzy — and nowhere do we get a full reproduction of the LP's inner-gatefold photo. Get outta here!

On the other hand, I hope Elliot Scheiner stays right where he is, if the mix here is a true indication of his current multichannel-mixing ethic. Because even if you think you know *Hotel California* inside and out, you haven't really heard it until you've gone down these six corridors. And once you check in, you'll never want to leave. Ken Richardson

SUPER FURRY ANIMALS Rings Around the World

XL/Beggars Banquet

Music ★★★★★ CD ★★★★★

STARSAILOR Love Is Here

Capitol

Music ★★★★★ CD ★★★★★

The British are coming, again! Two critically acclaimed albums from last year are just now appearing in the States. How strong was the acclaim? Well, Super Furry Animals' *Rings Around the World* was named Album of the Year for 2001 by England's *MOJO* magazine — and it's easy to hear why. These Animals, who hail from Wales, wear their pedigreed influences around their neck like dog tags made from a rock family tree. Roots of the Beatles and the Beach Boys branch into ELO, Dave Edmunds, and even Supertramp on tracks like "Alternate Route to Vulcan Street" and "Receptacle for the Respectable." The latter song even features Sir Paul McCartney, in a homage to the Beach Boys' "Vegetables," chomping percussively on fresh produce. (You can't make this stuff up, people.) Biting social commentary gets thinly disguised under a veil of semi-lush balladry, as in the alluring "Presidential Suite," a knock on Bill and Monica's tryst. With a few techno jabs thrown in to bring things crashing into the new millennium, *World* beats with a soft-rock heart that ultimately gives way to a dark, crunchy center.

Meanwhile, northern England's Starsailor (culling its name from the title of a 1970 Tim Buckley album) takes a more straightforward sonic route on its debut, *Love Is Here*. Yes, you could say that Starsailor borrowed a key to get through the door opened by Coldplay, but these guys prove they belong in the same room. In many ways, *Here* is the inverse of *World*, as the opening "Tie Up My Hands" can be seen as a map of the path not taken by the protagonists of "Presidential Suite." In "Hands," 21-year-old singer/writer James

Walsh, moving from a whisper to a wail, denies his impulses in the face of a potentially illicit coupling: "Want to love you but my hands are tied... / Let's watch the clock until the morning sun does rise." Driven mostly by acoustic guitar and piano, the album brims with optimism on cheery tracks like "Lullaby" and "Good Souls" — though one cut, "Alcoholic," condemns England's pub culture. Taken together, *Here* and *World* are divergent examples of how to depict two sides of the same coin.

Mike Mettler

CRACKER Forever Back Porch/Virgin

Music ★★★ CD ★★★★★

Those who follow Cracker have come to expect unpredictable zigzagging — in fact, that's what keeps the faithful tuned in. *Forever*, the latest curve on Cracker's scenic byway, is a sonically layered, midtempo, pen-sive affair. In general, Johnny Hickman's gui-

tar is recessed into the arrangements, where it shares space with Kenny Margolis's keyboards. And vocalist David Lowery's songs are subdued but oddly hopeful. He thrives on oxymorons like "Shine," a doleful, minor-key anthem to a brighter future, and "One Fine Day," which restates the same theme in a somewhat craggier musical setting. Speaking of restatement, the phrase "guarded by monkeys" appears in two songs, which may seem one too many, though Lowery no doubt has his reasons.

This is an adult album, given to looking back and taking stock. "Merry Christmas Emily" finds Lowery drolly musing on an old relationship ("We had some good times drinking cheap wine and popping pills"). "Miss Santa Cruz County" namechecks the home-base of his old band, Camper Van Beethoven, while affectionately dissing the shape-shifting tactics of bored, restless youth in a college town. And the bittersweet title tune, with an indomitable hook by the ever-resourceful Hickman, makes it clear that this album is less about forever than the end of those days when forever seemed a possibility.

Parke Puterbaugh

STAR SYSTEM

Stellar	★★★★★
Excellent	★★★★
Good	★★★
Fair	★★
Poor	★

Music or Performance refers to the primary content alone.

CD, DVD-Audio, DVD-Video, or Super Audio CD refers to its presentation on disc, including sound quality, multichannel mix, and extras.

LOU REED

Classic Albums: Transformer
Eagle Eye/Pioneer

Music ★★ DVD-Video ★★★★★

As a Lou Reed fan of some vintage, I've always felt that *Transformer* — his second solo album, coproduced by David Bowie and Mick Ronson — was overrated. Back in 1972 (its commercial success notwith-

A Tale of Two Natalies

Twin daughters of different mothers? These songbirds share some interesting traits, if the lyrics on their current CDs are any indication. Which Natalie is the more Natalie? Gosh, I'm torn between two wonders.

Ken Richardson



Imbruglia



Merchant

Where has Natalie landed?	<i>White Lilies Island</i> (RCA)	<i>Motherland</i> (Elektra)
Appropriate anagrams	Natalie Imbruglia: imaginable ritual.	Natalie: i.e., natal. Merchant: Man? Retch! Natalie Merchant: Hamlet incarnate.
Is Natalie fired up?	"Throw the beauty on the fire."	"This house is on fire!"
Burning revelation	She won't be copied (see page 88).	"Never again will I be taken twice."
What's the weather like where Natalie is?	"It came on like a hurricane."	"I've been walking all alone through the wind and through the rain."
Fairy-tale reference	"There's no chance, no hope for Cinderella."	"I know 'once upon a time' and 'ever after' is a lie." (<i>Are a lie, Nat.</i>)
Is Natalie a complicated girl?	"I like to keep it all simple."	"Lately, I've been satisfied by simple things."
Did Natalie predict the events of September 11?	"Everything wrong / Gonna be alright / Come September."	"I don't have the gift of prophesy." But: "Soon come the day / This tinderbox is gonna blow in your face."
Which lyric could Natalie use to put me in my place?	"Everyone's a cynic."	"You're just about the lowest and the dirtiest thing I've ever seen."

standing), the album seemed to be a rather dishonest piece of work, a case of Lou pandering to some imagined audience of post-pubescent sleaze seekers. As a result, I probably hadn't listened to it in 25 years before I checked out this new DVD-Video. An 80-minute look at *Transformer* song by song, it's one of the latest releases in Eagle Eye's documentary series, *Classic Albums*.

Along with the music itself, we get new interviews with Lou and the album's original engineer, Ken Scott, who walks us through the multitrack recordings of songs like "Vicious" and "Satellite of Love" (later the inspiration for the *Mystery Science Theater 3000* spaceship). Best of all is a segment starring the frighteningly grizzled Herbie Flowers, who demonstrates how the signature opening riff of "Walk on the Wild Side" was the fortuitous result of combining tracks of acoustic and electric basses. There's also some interesting archival footage of Lou in concert and the Velvet Underground at Andy Warhol's Factory. And the cherry on top (for me, at least) is the fact that the music — which sounds like it was recorded no later than last week — is presented in its authentic original mix, via Dolby Digital stereo.

As for *Transformer* itself, it still seems lightweight. But as a period piece, the album now has an undeniable kick to it. And let's acknowledge that "Walk on the Wild Side" remains the only song to crack the Top 20 despite the unambiguous use of the phrase "giv-

ing head," a feat that demands respect from mere mortals like us. Recommended.

Steve Simels

SOLAS The Edge of Silence

Shanachie

Music ★★★★★ CD ★★★★★

CATHIE RYAN

Somewhere Along the Road

Shanachie

Music ★★★★★ CD ★★★★★

The best contemporary Celtic music has a healthy respect for tradition along with a horizon-broadening slant — and there isn't a much better example than the music conjured up by America's Solas. Led by multi-instrumentalist Seamus Egan, the adventurous quintet keeps spinning forward, and its fifth album, *The Edge of Silence*, further widens its dazzlingly eclectic path. Dashes of Middle Eastern and gypsy music spice the Irish stew cooked up by Egan, fiddler Winifred Horan, accordionist Mick McAuley, and guitarist Donal Clancy on eye-openers like "Legless" and "Beck Street." And singer Deirdre Scanlan's reading of Tom Waits's "Georgia Lee" is as gorgeous as it is heartwrenching. Throw in some clever use of loops and distortion to go with the virtuosity, and it's clear the sky's indeed the limit for Solas.

Like Winifred Horan, singer Cathie Ryan is a veteran of the all-female Celtic troupe Cherish the Ladies. Ryan's latest solo album, *Somewhere Along the Road*, characteristical-

ly leans to the traditional side. But that's not to take anything away from her clear, forthright reading of many of the evergreens here (for example, the spry "Grace O'Malley"). Showcasing some fine originals — the buoyant "Carrick-a-rede," the evocative "Rathlin Island (1847)" — and aided by the sensitive work of fiddler (and producer) John McCusker, guitarist John Doyle, and accordionist Phil Cunningham, Cathie Ryan turns in the finest effort of her career.

Billy Altman

JAZZ

NORAH JONES

Come Away with Me

Blue Note

Music ★★★★★ CD ★★★★★

Young female sonic auteurs continue to be the big trend in mainstream jazz and related pop. There are staunch traditionalists like Diana Krall (who does have a sound of her own) and Jane Monheit (who doesn't yet, even though she's all of 24, *tsk-tsk*). And there are envelope-pushers like Cassandra Wilson and Dianne Reeves (who keep at least one foot in jazz). Now comes Norah Jones, the latest claimant to the crossover crown — and she's undeniably a major talent, with a deep, sexy voice and good (if not particularly jazz-endowed) piano chops. She also writes.

At 22, Jones already has her own style as a singer and a bandleader — employing open spaces à la Wilson but using country-style textures. This is very appealing on her debut CD, *Come Away with Me*, but it still needs work. Although, thankfully, she's not as icily cool as Patricia Barber, Jones remains a little detached. She also has a tendency to do too many original songs — all of which bear the



Coming Releases

WILCO Yankee Hotel Foxtrot

Rejected by Reprise, passed around on the Web — finally in stores. Nonesuch, April

ELVIS COSTELLO

When I Was Cruel

First solo album in five years. Island, April

JIMMY FALLON

The Bathroom Wall

SNL star: rock & yuks. DreamWorks, April

UPDATES!

The new album by Hank Williams, Jr., is called *The Almeria Club*. The new one by And You Will Know Us by the Trail of Dead is called *Source Tags & Codes*. And Mariah Carey's new gig, *Babysitter*, will be released April 1 on her new label, Gutter.

Quick Fixes

same tempo, the same instrumentation, and the same introspective stance. Small wonder that the highlight here is Hank Williams's "Cold, Cold Heart." Nevertheless, I hope Blue Note is willing to support Jones's experimentation through a few more albums until she discovers the right balance of new and old, jazz and whatever. *Will Friedwald*

BOBBY PREVITE & BUMP Just Add Water . . .

Palmetto

Music ★★★★★ CD ★★★★★

This is drummer/composer Bobby Previte's working band, veterans of five European tours together, so the simpatico element is quite strong. The varied program ranges from puckish (pianist Wayne Horvitz's "Leave Here Now") to cryptic (Previte's "Everything I Want") with stops for funk and ballads. The solos by tenor saxophonist Marty Ehrlich and trombonist Ray Anderson flow naturally out of the leader's theatrical compositions, and the Horvitz-Previte rhythm section is rounded out by Steve Swallow on bass. Overall, *Just Add Water* is a solid, slightly left-of-center session with a satisfyingly high "playful" factor. *Richard C. Walls*

CLASSICAL

BRAHMS Violin Concerto STRAVINSKY Violin Concerto

Hilary Hahn, violin; Academy of St. Martin in the Fields, Neville Marriner cond.

Sony Classical

Performance ★★★★★

Super Audio CD ★★★★★

Star soloists and record-company executives may still feel the need to revisit warhorses like the Brahms Violin Concerto — but if we are expected to care, they must offer something extraordinary. Hilary Hahn has the technique and the musicianship to play this concerto admirably, but not the bur-nished tone of the great interpreters. She and her collaborators, Sir Neville Marriner and the Academy of St. Martin in the Fields, are better suited to the jazzy rhythms and leaner orchestration of the Stravinsky Violin Concerto, which Hahn performs to perfection.

This remains an odd coupling of works, especially since the two pieces inhabit different sound worlds. And in either world, the multi-channel mix on this Super Audio CD is too subtle for its own good. The center channel is employed modestly, the subwoofer not at all — though added weight would have been welcome in the Brahms. The Stravinsky's brilliant and wide-ranging sonority could have benefited, too, from a more aggressive surround scheme. *Robert Ripps*

ALANIS MORISSETTE

Under Rug Swept

Maverick

Music ★★★★★ CD ★★★★★

Despite (or maybe because of) producer and collaborator Glen Ballard's absence, Alanis Morissette keeps getting better at what she does: a slicked-up version of indie-pop that succeeds on hooks and attitude. Her melodic skills come through more clearly here, and she has finally learned to integrate the loops and samples. Now, if only her lyrics weren't so clumsy. Obsessing over failed relationships may be excusable, but a line like "We best keep this to ourselves and not tell any members of our inner posse" is not. *Brett Milano*

SAM COOKE Keep Movin' On

Tracey/ABKCO

Music ★★★★★ CD ★★★★★

This culls the best of Sam Cooke's last sessions, when the soul singer was juggling styles. The bluesy phrasing of "Good News," the rhythmic melismata of "Good Times," and the grainy yet graceful delivery of "Another Saturday Night" attest to his range as a vocalist. Cooke's pinnacle is "A Change Is Gonna Come," inspired by the civil-rights movement, wherein he miraculously binds secular and sacred so tightly that no division is possible or necessary. The disc's greatest surprise is the unreleased title track, a musical statement of his beliefs that, like Cooke himself, is full of poise and determination in equal measure. *Parke Puterbaugh*

TANYA DONELLY beautysleep

4AD/Beggars Banquet

Music ★★★★★ CD ★★★★★

The heartbeat running through the opening song might lead you to think Tanya Donelly has done her own *Dark Side of the Moon*. Instead, she has recaptured the dreamlike ambience that flavored her best work with Belly and Throwing Muses. Donelly's recent motherhood provides a springboard for all manner of personal and spiritual reflections, so that her emotions are more upfront than usual. But between the haunted quality of her vocals and Rich Gilbert's out-there guitar sounds, *beautysleep* has the feel of a lovely hallucination. *Brett Milano*

WILLIE NELSON The Great Divide

Lost Highway

Music ★★★★★ CD ★★★★★

Even by the standards of the ever-game Willie Nelson, this is a strange set. While collaborations have never impeded Nelson's ability to remain his singular self, these one-offs with a random batch of associates (Bonnie Raitt, Lee Ann Womack, Brian McKnight, Kid Rock) suffer from a murky, overdone production that flattens out the identities of all involved. Fittingly, the one track that really works is the Kenny Rogers/First Edition psychedelic oldie "Just Dropped In (To See What Condition My Condition Was In)," where the cacophony seems appropriate. *Billy Altman*

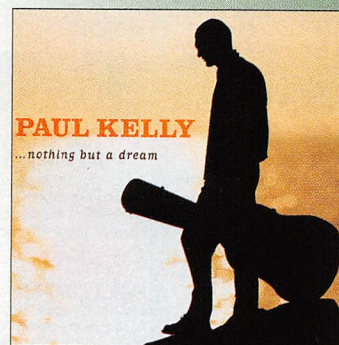
KASEY CHAMBERS

Barricades & Brickwalls

Warner Bros.

Music ★★★★★ CD ★★★★★

Nashville West may be further west than anyone imagined. With her coquettish, catch-in-the-throat voice, Australia's Kasey Chambers makes good on the promise of her debut, *The Captain*, with this fine set. She takes on a variety of tough and tender trad-country styles with help from admirers both Aussie (the Living End, Paul Kelly) and American (Lucinda Williams, Matthew Ryan). Kasey is a honky-tonk angel with a mind of her own. Just don't believe her when she sings, "I don't have a heart," because *Barricades & Brickwalls* is all about heart. *Parke Puterbaugh*



PAUL KELLY

. . . Nothing but a Dream

Cooking Vinyl/spinART

Music ★★★★★ CD ★★★★★

You've caught the buzz on Kasey Chambers and picked up *Barricades & Brickwalls*, and now you're wondering "Who is that guy?" on the climactic "I Still Pray." This is that guy, and here's another milestone in his 20-year career, opening with solo-acoustic regret ("If I Could Start Today Again"), cresting with a rock anthem ("Love Is the Law"), and closing with solo-acoustic homelessness ("Smoke Under the Bridge"). Bonus for Yanks: four super songs from the *Roll On Summer* EP, including the right-on rant that, without good lovin' and good music, "Every F-king City" is the same. *Ken Richardson*

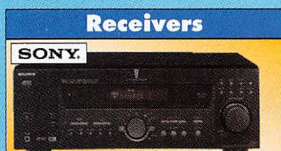
THE SUNSHINE FIX

Age of the Sun

Emperor Norton/Kindercore

Music ★★★★★ CD ★★★★★

A sure contender for the 2002 release with the most xylophones on it, this charming disc from Bill Doss picks up where his previous band, the Olivia Tremor Control, left off, complete with the requisite long oddball track. Doss loves the mix of bubblegum pop and trippy overtones, breathy vocals and Beach Boys harmonies, layered arrangements and studio trickery. And if he sometimes winds up sounding exactly like early ELO (especially on the ballad "A Better Way to Be"), well, there's no shame in that. *Brett Milano*



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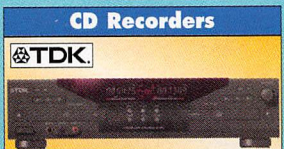
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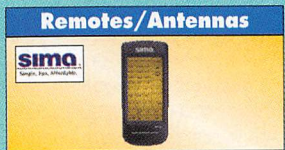
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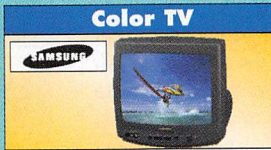
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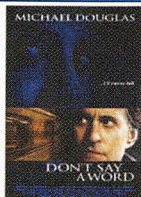
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- Audio CD

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- Audio Left/Right Input
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Rear Connections:

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- Component Video In/Out
- S-Video In/Out
- Video In
- Video Out (2x)
- Audio L/R In/Out (2x)
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- Repeat (Chapter/Title/All) or (Track/All)
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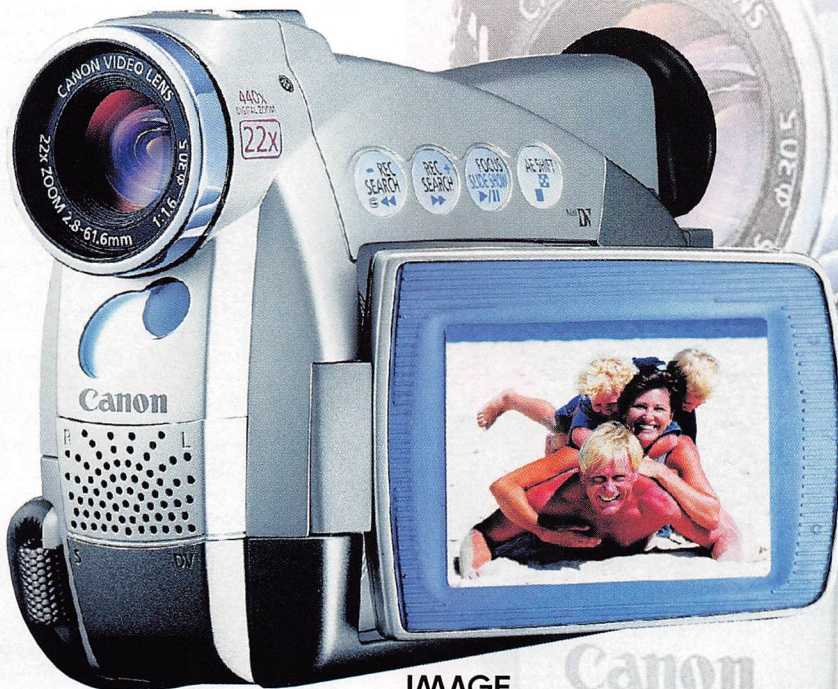
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Effect

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- WL-D73 Wireless Controller
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- STV-250N Stereo Video Cable
- DVM-E30 DV Cassette & Lens Hood

GL1
Professional
L-Series Fluorite
Mini DV



Weight: 2 lbs. 12 1/8 oz.
Dimensions: 4 5/8"W x 5 3/8"H x 10 3/4"D

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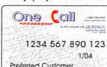
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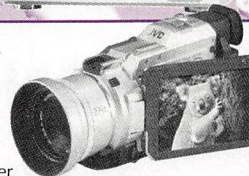
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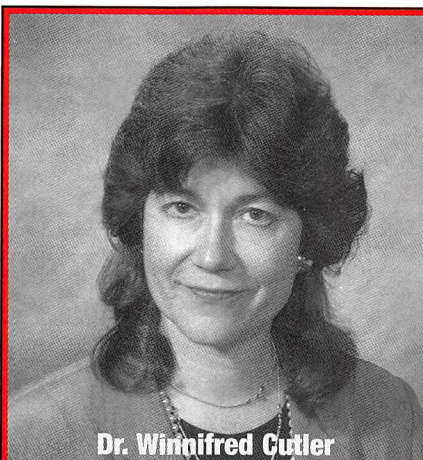
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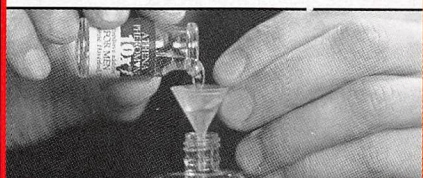
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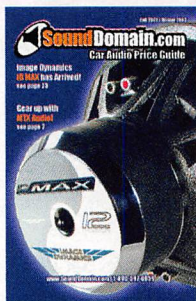
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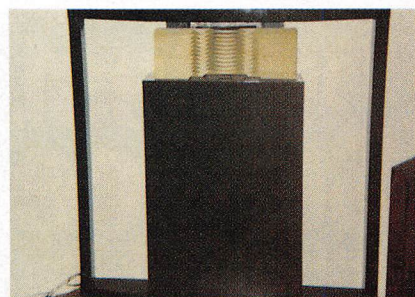


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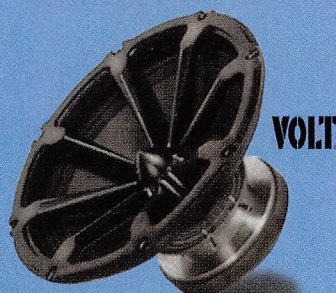
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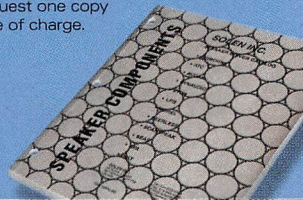
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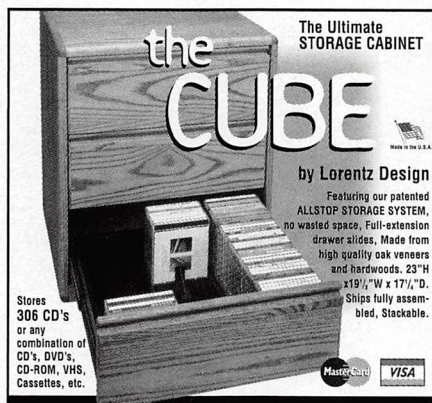
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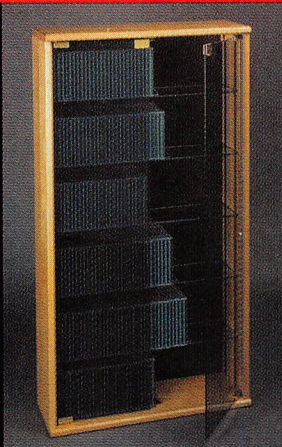
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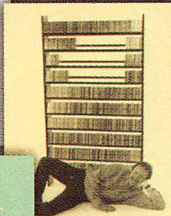
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If you purchased new at retail in the United States or acquired through an Identifiable Gift Transfer in the United States: (i) a DVD player bearing the Panasonic brand name with one of the following Model Numbers: A105, A110, A310, K510 or X410; or (ii) a DVD player bearing the JVC brand name with one of the following Model Numbers: XV-501BK, XV-511BK, or XV-D701BK,

PLEASE READ THIS LEGAL NOTICE

The purpose of this notice is to inform you of a proposed settlement of a class action, *Fundock, et al. v. Matsushita Electric Corporation of America and JVC Americas Corp.*, Docket No. L-7552-00, as explained in detail in a Notice of Class Action Settlement, which you are encouraged to obtain and read in its entirety. The goal of the Settlement is to provide relief to persons who purchased certain DVD players bearing the Panasonic and JVC brand names, which are alleged by plaintiffs to experience, or be susceptible to, performance problems. If you purchased new at retail in the United States or acquired through an Identifiable Gift Transfer in the United States: (i) a DVD player bearing the Panasonic brand name with one of the following Model Numbers: A105, A110, A310, K510 or X410; or (ii) a DVD player bearing the JVC brand name with one of the following Model Numbers: XV-501BK, XV-511BK, or XV-D701BK (hereinafter, the iDVD Players at Issue), you may be a member of the Class and your rights will be affected by legal proceedings in this action.

A iSettlement Hearingⁱ will be held at the Superior Court of New Jersey, Law Division, Middlesex County, on March 22, 2002 at 9:00 a.m. to determine: (1) whether the proposed settlement of this action is fair, reasonable and adequate; (2) whether a final judgment should be entered dismissing the litigation on the merits as to the manufacturers of the DVD Players at Issue, Matsushita Electric Corporation of America (i Matsushita) and JVC Americas Corp. (i JVC), and, collectively with Matsushita, the i Defendantsⁱ, and certain parties associated with the Defendants; and (3) whether applications to be made by Class Counsel for payment of fees and reimbursement of expenses and an incentive fee award to Plaintiffs should be approved by the Court.

Under the Settlement Agreement, Defendants will arrange to provide eligible Settlement Class Members who timely submit and properly complete Claim Forms with either: (i) cash reimbursement of repair costs up to \$100.00 per DVD Player at Issue; (ii) a \$50 Rebate Certificate for persons who experienced performance problems with their DVD Players at Issue and replaced their DVD Units with another manufacturer's DVD player; or (iii) extended warranty coverage that provides for the repair or, at Defendants' option, replacement of the Settlement Class Members' DVD Player at Issue.

The proposed settlement is not deemed or construed to be an admission or evidence of any violation of any statute or law or any liability or wrongdoing by defendants or the truth of any allegations of the lawsuit.

You have a right to be excluded from the Class as detailed in the Notice of Proposed Class Settlement. If you wish to be excluded you must do so in writing, as detailed in the Notice of Proposed Class Settlement.

If you properly request exclusion, the terms of the settlement will not be binding as to you. If you do not request exclusion from the Class and the settlement becomes effective, you will be bound by the terms of the settlement.

If you choose to remain in the Settlement Class and participate in the benefits of the proposed settlement if its finally approved, you must complete a Claim Form and return it with the required supporting documentation no later than May 20, 2002 to the Claims Administrator, Gilardi & Co. LLC, P.O. Box 8060, San Rafael, CA 94912-8060.

Questions about this settlement should be directed to Plaintiffs' Lead Counsel: Lee S. Shalov, Shalov Stone & Bonner, LLP, 485 Seventh Ave., Suite 1000, New York, New York, 10018 (www.lawssb.com).

This is a summary notice only. To obtain the Notice of Class Action Settlement & Claim Form, call: 1-800-805-2531, or visit www.dvdssettlement.com.

PLEASE DO NOT CONTACT THE COURT

Dated: January 18, 2002

By Order of the Superior Court of New Jersey,
Law Division, Middlesex County

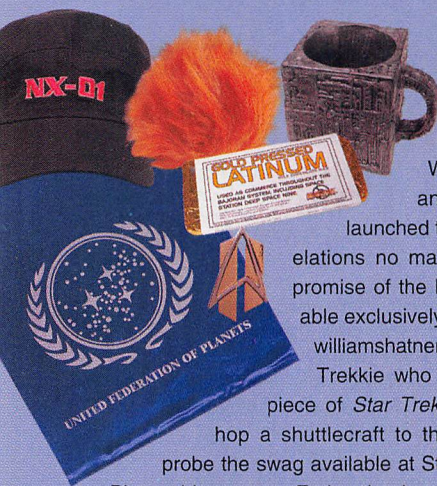
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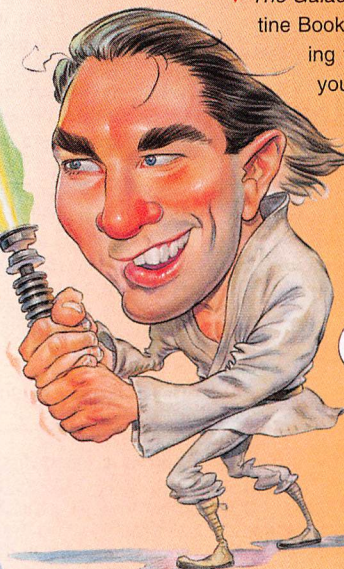
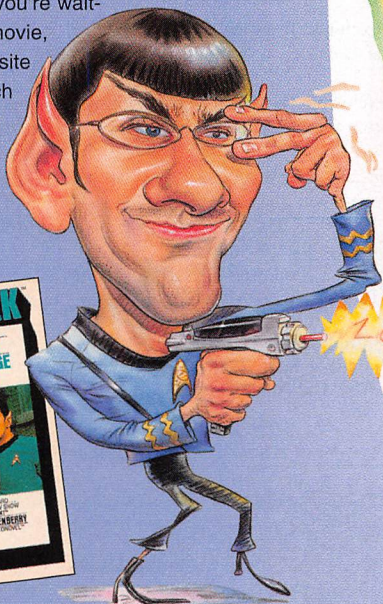
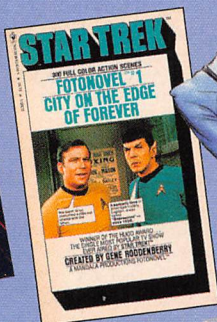
EDITED BY MICHAEL GAUGHN

NERDY THINGS TO DO WHEN YOU'RE NOT READING **SOUND & VISION**

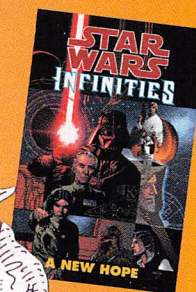


Hard to believe after 35 years of interviews, conventions, and TV specials that William Shatner and Leonard Nimoy have anything new to say about the show that launched their careers. Yet behind-the-scenes revelations no man has heard before are the promise of the DVD *Mind Meld* (\$20), available exclusively through Shatner's Web site, williamshatner.com. Fascinating. ♦ Any Trekkie who thinks he/she/it has every piece of *Star Trek* memorabilia should best hop a shuttlecraft to the Las Vegas Hilton and probe the swag available at *Star Trek: The Experience*. Pictured here are a Federation banner (\$28), Scott Bakula's cap from *Enterprise* (\$10), a tribble (\$13), a chocolate bar of gold-pressed latinum (\$3), a Borg-cube mug (\$13), and a Starfleet badge from a parallel universe (\$10). ♦ Among the strange, new worlds the original *Trek* crew explored was the "fotonovel" — a book-format retelling of the TV episodes with still pictures paired with dialogue in word balloons, resulting in a very comics-like experience. Only about a dozen *Star Trek* fotonovels were ever published, though they're still a historical oddity, if you can find them. ♦ Starting with the Gold Key mags in the '60s, *Trek* comics had many incarnations, but they reached their creative apex when veteran sci-fi scribe Peter David briefly took over the adventures of the original crew for DC comics in 1989. His run included a memorable three-part trial of Captain Kirk, Kirk's days at Starfleet Academy, and a surprisingly moving tribute to all those red-shirted security guards who were slaughtered by various alien bad-dies every week. ♦ And while you're waiting for this year's *Star Trek* movie, *Nemesis*, surf by the Roll Call site (seska.home.netcom.com), which tallies every minor crewmember ever seen, mentioned, or killed on board the Federation starship Voyager.

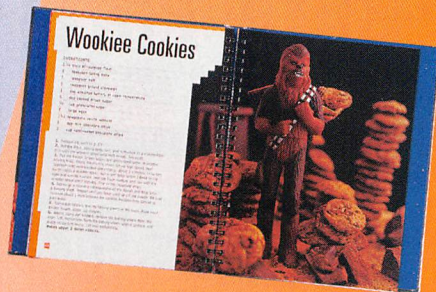
— Lt. Cmdr. Peter Pachal



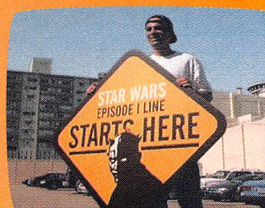
TRAVEL, YOU WILL. PREPARED, YOU MUST BE.



STAR TREK vs. STAR WARS



Even the hungriest of Hutts will be satisfied when Boba Fettucine, Amidala Challah, and Qui-Gon Jinn-ger Snaps are on the menu. All can be found in the *Star Wars Cookbook: Wookiee Cookies and Other Galactic Recipes* (Chronicle Books, \$16) — which, in the *Star Wars* tradition, has already spawned a sequel: *Star Wars Cookbook II: Darth Malt and More Galactic Recipes* (\$16). ♦ Since the first three *Star Wars* films won't be coming out on DVD until after the 2005 release of *Episode III*, here are a couple of discs to tide you over in the meantime: *George Lucas in Love* (Red Hill, \$15) tells the story of an awkward but lovable film student unable to complete the screenplay for his "agricultural space tragedy" — until the appearance of his muse, Marion, who sports a familiar-looking hairdo. *Starwoids* (Ventura, \$20) documents the *Star Wars* fanatics who waited in line for six weeks to see *The Phantom Menace*. Watch out for overzealous Trekkies who protest the event bearing "Kirk, not Kenobi" signs. Truly the definition of "get a life." ♦ The CD *Cocktails in the Cantina* (Oglio, \$16) is a jazzy trip through the *Star Wars* universe that will leave you both shaken and stirred. ♦ What if Luke had missed his mark during the attack on the Death Star? That's the premise behind Dark Horse Comics' graphic novel *Star Wars: Infinities* (\$13). ♦ Aside from *Attack of the Clones*, this year's biggest *Star Wars* event will be "Celebration II." Running from May 3 to 5 at the Indianapolis Convention Center, this official convention will celebrate the release of *Episode II* and commemorate the 25th anniversary of the original film with celebrity appearances, exhibits, memorabilia, and more. Register at starwarscelebration.com.



♦ The *Galactic Phrase Book & Travel Guide* (Ballantine Books, \$8) is an invaluable tool when traveling through the *Star Wars* galaxy. Whether you're bargaining for your life or just trying to partake in some small talk with a Wookiee, you won't want to leave your moisture-farm dwelling without it. — Rogue Leader Drew Thompson

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